GEORGIA'S STRUCTURALLY UNEMPLOYED WORKERS:

DO STATE JOB TRAINING PROGRAMS HELP?

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SUMMARY

Manufacturing employment in Georgia has declined as thousands of jobs have been lost to foreign suppliers and improvements in productivity. Changes in the state's industrial structure have created mismatches between worker capabilities and the skills required to work in a new field. The transition from a manufacturing to a services economy has strained the ability of many in the state's workforce to acquire to the new job skills demanded by employers. In order to regain employment and maintain former wage levels, structurally unemployed workers need new skills to work new jobs. Unemployed workers sometimes turn to workforce development system (WDS) programs to upgrade skills and provide access to better employment. The purpose of WDS job training services is to facilitate the transition from job loss to stable re-employment. Which job training strategies work or do not work and or for which demographic groups was the focus of this research.

The fundamental question posed by this research was, "Can job training help alleviate the adverse wage impacts and time spent in prolonged job search resulting from structural unemployment in Georgia, and if so, which programs work better?" Answering this question requires that structurally unemployed workers in Georgia be assessed with respect to industry, demographics, geography, and Georgia Department of Labor (GDOL) training program exposure as explanatory factors for post-training wage and job search time differentials, both direct indicators of program efficacy to workers. Multivariate regression techniques were used to estimate the impacts of GDOL job

training services on workers exiting the state's structurally declining industries and reentering new employment.

Compared to previous studies, this research is unique in significant ways. This work: 1) focused on the effectiveness of job training to structurally unemployed workers; 2) used state government microdata to link firms, wages, job training, UI, and demographics; 3) analyzed job training services separately, not as an aggregation; 4) tracked a large number of participants in a multiyear study; and 5) used inter-sectoral employment transition diagrams, a new and novel method to illustrate the wage effects of workers leaving structurally declining industries to their new employment.

Among the findings of this research were that: 1) job training was often associated with lower worker wages once re-employed and longer times spent in job search; 2) compared to short-term unemployed workers from declining industries, the long-term unemployed experienced significantly larger adverse wage effects and longer job search times; 3) job training services were found to be most beneficial to workers leaving less-skilled industries such as Food & Beverages, Hotels and Motels, and General Merchandise and less beneficial to structurally unemployed leaving higher-skilled industries such as manufacturing; 4) informational job training services were determined to be more cost-effective than occupational skills training; 5) the wage and job search time impacts for females were generally superior to those for males; 6) the divergence between trainee and non-trainee wages increased over time; and 7) race was usually not found to be a significant factor for wages or job search time impacts. Though it cannot be conclusively demonstrated with the data available to this research, it is very likely that the negative wage and time impacts associated with job training were the result of the

personal characteristics of the self-selected trainees who often pursued training because of a lack of success in the job market and not an inherent defect of the GDOL job training experience.

CHAPTER 1

INTRODUCTION

1.1. The Findings in Brief

Only two of Georgia's economic sectors—Manufacturing and Administration and Support Services—accounted for almost all of the total net employment loss during the 1999-2003 study period. This research determined that the largest sources of employment decline in Georgia were attributable to shifts in industrial structure and, to a lesser degree, diminishing demand for certain goods and services. In Georgia, manufacturing has led other industry groups in terms of net job losses with Textiles and the Apparel industries the most prominent. Georgia lost manufacturing jobs due to the offshoring of productive capacity, improvements in productivity and economies of scale, declining demand, and the increasing presence of large, cost-efficient retailers.

Concentrated employment loss in a few sectors of the economy is indicative of intense structural change. Structural unemployment results from the difference between potential Gross Domestic Product (GDP) and actual GDP, reflecting the loss of unemployed workers to productive output. Long-term unemployment is cyclical but structural unemployment is not. Cyclical unemployment can be addressed by economic stimulus policies but structural unemployment is not responsive to government counter-cyclical policies. This research primarily focuses on structural unemployment and its remedies, prominent among them job training services, but also assesses long-term unemployment, here defined as a period of joblessness in excess of six months.

The most important question addressed by this research was whether Georgia Department of Labor (GDOL) job training services alleviated the adverse effects of

structural employment such as long periods of time spent searching for new work and reduced wages once reemployed. The findings indicated a qualified yes, at least for some demographic groups in some industries. But overall, GDOL training services were determined to be ineffective for the average trainee compared to non-trainees, at least for the structurally declining industries analyzed in this research.

Why did trainees do less well on average than non-trainees? It is unlikely that GDOL job training services actually lowered trainee wages or increased the time spent in job search. Like much of the job training literature, this finding is consistent with the idea that worker personal characteristics play an important role in determining post-training outcomes. However, the effectiveness of GDOL job training services was found to vary depending on trainee demographics, the type of job training service received, whether the trainee lived in an urban or rural area, and the industries from which the structurally unemployed workers exited.

The walk-in services provided by the GDOL in their One-stop Centers provide initial job search assistance, résumé preparation, and interviewing and "life" skills instruction, predominately had negative wage and job search effects. However, Skills Upgrade trainees experienced positive wage effects, especially for females, which is especially important because that category most directly involves the traditional areas of job training focused on higher-paying assembly line skills. Unfortunately, relatively few workers actually participated in Skills Upgrade training, a result of funding constraints for this type of training versus the relatively inexpensive walk-in Core and Intensive informational services.

Cost effectiveness analyses (CEA) demonstrated that while Skills Upgrade training yielded significantly larger wage impacts, the higher program costs made the relatively less costly Intensive services more efficient for provision of services to more participants under stringent budget constraints. Skills Upgrade training had an especially large effect on the wages of females. The positive impact of Skills Upgrade training is important because that program most directly involves the traditional areas of job training associated with relatively well-compensated factory skills.

The retraining of workers transitioning from the structurally declining manufacturing super-sector is especially important because their wages have historically been the foundation of many local economies throughout the state of Georgia. Unfortunately, the average wage impact for trainees leaving declining manufacturing industries was negative, similar to the result for declining industries as a whole.

Workers exiting the Food & Beverage and other lower-skilled industries did evidence positive wage and job search effects from job training services. . Many of these workers found stable new employment in industries with higher average wages and trainees earned a premium over non-trainees. Food & Beverage workers benefited more from job training services because, compared to more highly-skilled workers from other industries, they initially had lower levels of human capital so training had a larger impact on worker skills and wages. While retraining structurally unemployed workers from manufacturing for jobs in new fields at comparable pay is appealing, this research concludes that GDOL job training services were more likely to improve the wages of workers in low-skill, low-wage jobs that require little human capital.

The research findings revealed a definite geographic pattern in which trainees in rural areas experienced larger negative wage differentials upon re-employment and longer job search times compared to non-trainees. The finding that the goods-producing rural areas had larger adverse wage and job search time impacts from job training compared to the more service oriented urban areas is consistent with the idea that economic centrality is important to attachment to the labor force.

This research concluded that for job losses in services, retraining for work in new sectors may be less useful than re-connecting them to other service jobs, either regionally or via worker mobility strategies. For manufacturing workers, retraining in that sector may not be a useful option because of industry shifts that mean the jobs will not return. Retraining for new industries can only be effective if the occupations trained for are those demanded by local industries.

The research findings show that for certain demographic groups, females primarily, and certain training services, Intensive Services and Skills Upgrade training, GDOL job services were of net benefit to trainees and the society at large. A very significant finding was that job training is, on average, ineffective at raising the wages of workers leaving the manufacturing sector or reducing the time spent in job search but trainees from other industry sectors, particularly retail and the services sector, often experienced positive effects from job training services. In conclusion, GDOL job training services did not benefit all workers, particularly skilled workers from declining industries such as manufacturing, but were clearly beneficial to lower-skilled workers from the less well-paid service industries.

1.2. Background to Research

Georgia's economy has been growing vigorously for decades but the national transition from manufacturing to services has strained the ability of many in the state's workforce to acquire the job skills demanded by employers, especially for the high-growth, high-skilled jobs of the "new" economy. Decreasing job security and continuing impacts due to sectoral shifts from manufacturing and other goods-producing industries to service industries characterizes Georgia labor markets. Changes in the state's industrial structure have created mismatches between worker capabilities and the skills required to work in new sectors of the economy and have also contributed substantially to long-term unemployment rates. Some workers have been favored; demand in the information services sector has been strong, for example. But other workers—from the textile and other "real goods" industries—have been hurt by the broad structural shift from manufacturing to services.

Previously dependent on extractive industries such as farming, growth in manufacturing took the place of farming in Georgia's economy during the 1960s and '70s bringing economic growth and improved living standards. Georgia's economic growth has been higher than that of the nation but that long-term trend has begun to converge with the U.S. as a whole. Manufacturing jobs have declined in significance as thousands of jobs were lost to more competitive foreign suppliers and technological innovation allowed employers to downsize the workforce. In order to regain employment and maintain old-industry wage levels, structurally unemployed workers need new skills to work new jobs. The purpose of job training services is to facilitate the transition from job loss to stable re-employment. The major adverse effects of unemployment--short- and

even long-term wage losses often coupled with a longer time spent in job search--are easily identified but surprisingly there is less agreement on the appropriate public response to the problem.

There is a solid political consensus generally supporting the wisdom of job training for skill-deficient workers. Conservatives and liberals agree that job training services are nominally an important part of addressing the problem of re-skilling America's workforce to meet industry demands. Given this consensus, it might seem that the efficacy of workforce training is clear, but this is not the case. These groups differ substantially with respect to the nature of the problem and the necessary vigorousness of the government's response to it. Conservatives emphasize worker responsibility in promptly finding new work and the importance of other adaptive responses such as the willingness to accept lower wages and to relocate if necessary. Liberals focus more on raising levels of worker "human capital" such as job training and educational experiences. But there are growing numbers of the long-term unemployed, often a symptom of underlying structural shifts, and subsequent to job training many workers unfortunately do not regain former wage levels.

This research focuses on extended joblessness and other impacts such as lower wages resulting from dislocation from a declining industry. The central research question here is, "Can job training help alleviate the adverse wage impacts and time spent in prolonged job search resulting from structural unemployment in Georgia, and if so, which programs work better?" Although politicians have found consensus, the job training literature (from the planning, economics, human resources, and program evaluation fields) is sharply divided on the subject of the usefulness of job training. Some studies

show positive effects from job training services; a higher wage for trainees compared to untrained workers with similar characteristics. But other job training studies show the opposite; few wage gains and often an actual decrease in wages for trainees compared to non-trainees once re-employed. Why are studies so divergent on job training's usefulness and why, after decades of such programs, is there not more agreement? This dissertation research investigates the received wisdom that job training services are broadly useful to restoring worker employment and wages.

1.3. Unemployment in Georgia's Declining Industries

When leaving a declining industry, many workers experience difficulty getting a new job because of a local surplus of workers because of a lack of demand for those skills in the local economy. Long-term unemployment, jobless spells of six months or more, occurs when workers lose employment due to a temporary slackening of demand due to the economic cycle of "boom and bust." Structural unemployment occurs when workers desiring employment are unable to fill available positions because they lack the requisite skills, do not desire to migrate where jobs are available, or are unwilling to work at the prevailing market wage. Structural unemployment occurs when workers forced out of declining industries cannot find work with their old skill sets. Long-term and structural unemployment share many common elements and often appear in conjunction with each other. For workers experiencing job loss, the restructuring of industries and firms has dramatically changed reemployment prospects not only because of the rapid pace of technological change but also because of the disintegration of internal labor markets and career ladders within firms.

Once unemployed, some workers may remain jobless for months or longer. Some of Georgia's former manufacturing workers have found reemployment in high growth services industries but many have remained unemployed for a protracted period, some prematurely exiting the labor force. Reentry into the workforce, if it occurs at all, often requires that workers abandon old lines of work, often involuntarily accepting lower wages. Historically, thinking about long-term unemployment has been largely confined to young people, minorities and other hard-to-employ groups, but recent evidence suggests that older, experienced workers are also substantially affected. Faced with the prospect of undesirable jobs and/or lagging wages, the long-term and structurally unemployed sometimes turn to workforce development programs to upgrade skills and provide access to better employment. To meet the needs of these unemployed, workforce development systems must provide a wide variety of training and education services to an educationally and geographically diverse clientele. Which employment and training strategies work or do not work, and for what groups in what areas is a key question.

Applied to the problem of long-term and structural unemployment in Georgia, planning methodologies can link new knowledge of the extent of the problem to actions in the public domain such as strategies for programmatic changes in the State's Workforce Development System (WDS), an effort headed by the Georgia Department of Labor (GDOL). Answering this question requires that the structurally and long-term unemployed in Georgia be identified with respect to the frequency and duration of unemployment, geography, and demographic factors. This is a varied population—young and old; blue-collar and white-collar; skilled and unskilled; male and female; black, white and other minorities—each with its own distinctive set of training and

educational needs. Answering the research questions also requires that Georgia's current WDS programs be evaluated in light of the diverse needs of the long-term and structurally unemployed. System capacity—the availability of suitable training slots, spatial access—and system effectiveness— positive pre- and post-training wage differentials, job stability—are indicative of program efficacy to the long-term unemployed. Where mismatches exist between the needs of the long-term unemployed and the current WDS, remedial programmatic changes will be suggested by this research.

1.4. Research Goals and Objectives

Are Georgia's job training programs effective in alleviating structural unemployment from declining industries such as the textile (mostly in rural areas) and technology-related (predominately in urban areas) industries? Answering the central research question requires that structurally unemployed workers in Georgia be assessed with respect to demographics, geography, industry, and GDOL training program exposure as explanatory factors for post-training wage and time-to-reemployment differentials, both direct indicators of program efficacy to workers.

Worded as a formal null hypothesis, the research question can be restated: "Georgia Department of Labor job training programs are ineffective at alleviating structural unemployment." If this hypothesis cannot be rejected by the objective data on worker pre- and post-training wages, unemployment history, and experiences with GDOL job training services, then, if statistically significant, the research hypothesis will be rejected for an alternate hypothesis of positive wage and reemployment effects from job training. The rationale behind this alternate hypothesis is that job training is an effective means of building the human capital of structurally unemployed workers, significantly

improving their chances of re-employment at an equal or increased wage. This hypothesis recognizes the possibility that some job training services may be more effective than others at alleviating long-term and structural unemployment for different segments of the structurally unemployed worker population.

It is argued here that job training has the potential to have beneficial effect on both structurally unemployed workers and the economy generally. If the hypothesis is proven true, proponents of job training programs will have additional concrete arguments to increase job training program funding. If the hypothesis is proven false, the Georgia Department of Labor and other job training institutions should rethink current approaches to alleviating structural unemployment.

1.5. Research Organization

Figure 1.1 describes how the research in this dissertation is organized by chapters and the major topics appearing in them.

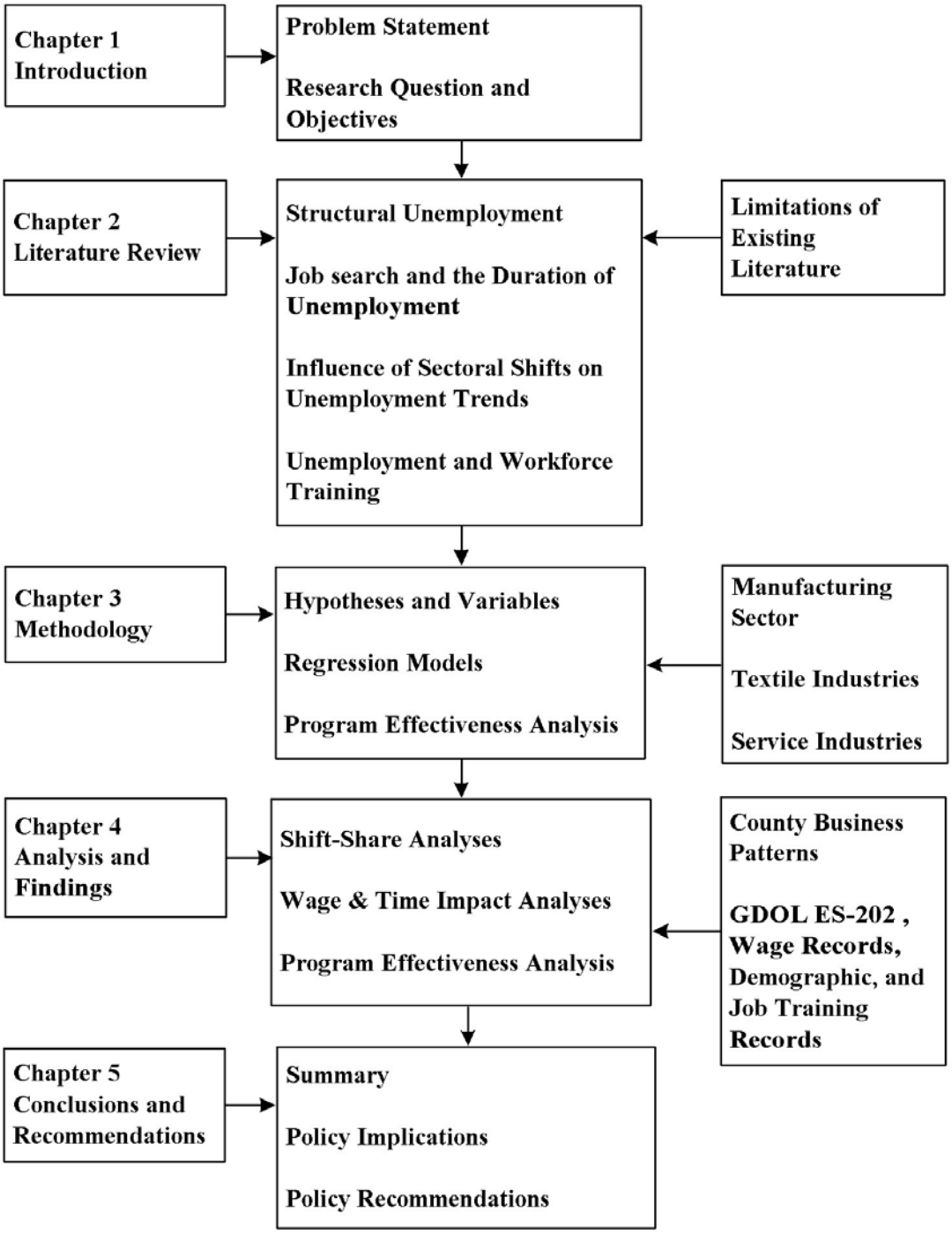

Figure 1.1. Chapter and Topic Organization

CHAPTER 2

LITERATURE REVIEW

2.1. Salient Characteristics of Unemployment

Unemployment is an economic phenomenon with social consequences. The unemployment of a worker can be transient, lasting only a few days or weeks, or it can be persistent, lasting months or even years. Joblessness can result from the closing of a firm, perhaps due to the sudden presence of new competitors in the local market or even the death of an owner. In such cases the effects, while potentially terrible for the workers and families directly involved, are usually easily absorbed by the local economy. In other situations, however, especially where an entire industry is declining in employment due to offshore competition or improvements in productivity, the effects can be devastating and the economic and social consequences much more severe and widespread, adversely affecting thousands or even millions of workers.

The term "structural unemployment" is sometimes used to denote the joblessness and downward wage mobility which results from changes in the basic organization of the industrial structure. These changes adversely affect specific sectors of the economy and often cause long-term spells of unemployment lasting six months or more. These changes can simultaneously open new positions for trained workers while closing positions which are no longer in demand. Imbalances between the skills and other characteristics of workers in the labor market and the evolving needs of employers creates the need for services such as job search and training .

Potentially, job training can be an important link between structurally unemployed workers and the new skills that can help them be economically viable in a

reshaped industrial environment. While nominally a straightforward concept, delivering effective job training serivces to a broad worker population is a complex undertaking requiring a knowledge of: 1) the flow of labor through the national and state economies; 2) types and measures of unemployment; 3) the influence of industrial restructuring on unemployment; 4) the demographics of unemployment; 5) workforce development systems and job training; 6) job training legislation; 7) approaches to job training; and 8) the effectiveness of job training. This literature review addresses each of these areas with an overarching focus on critical comparisons between current practice and alternative approaches to the provision of effective job training services to long-term and structurally unemployed workers.

2.1.1. Measures of Unemployment

The American workforce, like those of all market economies, is continuously being reshaped as employees lose jobs, find new jobs, or leave because of disability, retirement or other reasons. Figure 2.1 illustrates this dynamic process from 1970 through 2003; a period during which the American economy added more than 60 million workers and the level of unemployment never exceeded 4.1 million. The upward trend in the level of employment is evident as is the relatively low level of unemployment. For this period, Georgia's employment growth mirrored or improved on this national trend in employment growth.

In a market economy, some unemployment is inevitable as workers transition between jobs but extended periods of joblessness are problematic for both the economy and individual. Understanding these flows requires concise definitions of employed, unemployed, and not-in-the-labor-force. As straightforward as this sounds, there has

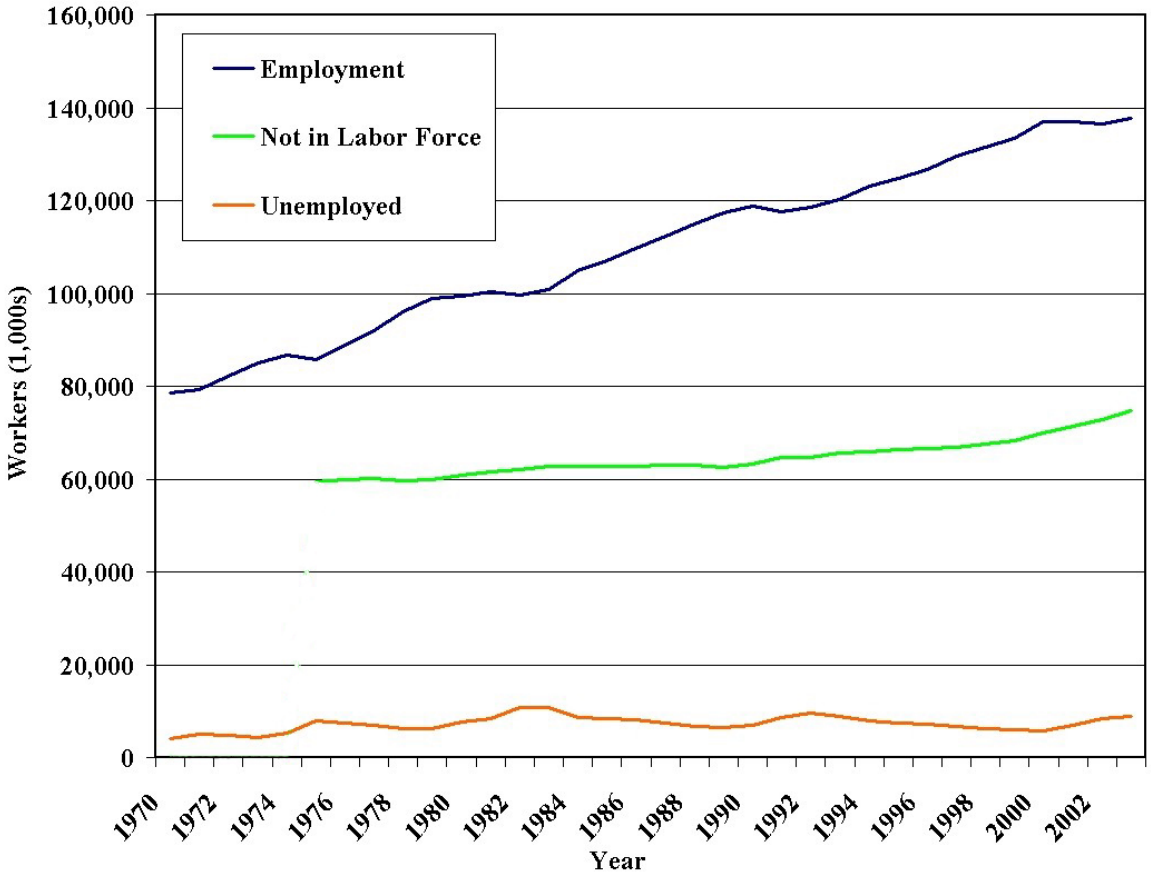

Figure 2.1. U.S. Employment, Unemployment and Not-in-the-Labor-Force, 1970-2003
Source: Current Population Survey

been considerable disagreement about who qualifies for entry into each category, particularly those not-in-the-labor-force (NLF) (Flinn and Heckman 1983). Reasons for remaining outside the labor force are numerous—many choose not to work—but the distinctions between the unemployed, the NLF, and discouraged workers who are no longer looking for a job are important because behavioral motivation is key to reattachment to the workforce in the event of job loss (Flinn and Heckman 1983).

Unemployment occurs as a result of many factors, both economic and human. Unemployment is a controversial political issue because it often reveals the winners and losers in a competitive market economy where labor is viewed as a commodity item.

Unemployment is troublesome for many reasons: first, unemployed individuals and their families pay a large price in terms of economic hardship and emotional burdens; second, high levels of unemployment are indicative of inefficiencies in the economy as potential workers are idled and their potential labors lost to the economy; and third, high unemployment also reflects a period of low performance for the economy (Kaufman 1994).

Though unemployment is easy to define in principle—persons not working are obviously unemployed—in practice, the definition is more complex. Many people are not in the labor force because they do not want to be. Others may claim to want work but may not take a particular job if offered. Unemployed workers can leave unemployment either by getting a job or leaving the workforce entirely (Flinn and Heckman 1983). Should a person be considered to be unemployed if no effort at job search has been made for months? Should part-time work constitute a job if the worker desires full-time employment? Obviously, there can be no single rule about what constitutes unemployment but some definitions are necessary.

One criticism of the official unemployment rate is that it does not include underemployed workers such as part-timers desiring full-time work. Also not included are long-term, unsuccessful job seekers who have become discouraged and are no longer actively looking for work. Both these factors tend to underestimate the unemployment rate but are at least partially offset by government programs such as Unemployment Insurance (UI) and Temporary Assistance to Needy Workers (TANF) which permit extended job searches by deflecting, to some extent, the economic hardship of unemployment.

In response to concerns that the official unemployment rate of the U.S. Department of Labor does not accurately reflect the degree of job loss, the Bureau of Labor Statistics (BLS) compiles and publishes additional measures of unemployment which permit a fuller understanding of the structure of U.S. unemployment. Figure 2.2 illustrates six different measures of unemployment for the U.S. economy over the period 1970 to 2003, ranging from 15 weeks or less (U1) to U6 which also includes discouraged, marginal workers, and those working part-time involuntarily.[1] The official unemployment rate frequently reported in the press (U3) is an intermediate measure intended to provide a blend of short-term and longer-term unemployment. The Figure shows that most unemployed workers find work within 15 weeks of losing their job, an overall indication of a well-functioning labor market.

Unemployment has been a persistent feature of the U.S., varying over the course of the business cycle and affecting some groups more than others. Figure 2.2 depicts the long-term trends in post-1970 unemployment to date. Until the mid-1980s, the trend in post-World War II America had been rising unemployment (upward-sloped dotted line), from 4.6 percent from 1950-1960, to 7.2 percent during the 1980s (Kaufman 1986). The most remarkable feature of Figure 2.2 is the reversal, in 1983, between long-term trends of rising and falling unemployment (downward sloping dotted line). Up until 2000, the trend had been declining joblessness since 1983. While the fall in unemployment could

[1] Marginally attached workers are persons who currently are neither working nor looking for work but indicate that they want and are available for a job and have looked for work sometime in the recent past. Discouraged workers, a subset of the marginally attached, have given a job-market related reason for not currently looking for a job. Persons employed part-time for economic reasons are those who want and are available for full-time work but have had to settle for a part-time schedule. Source: U.S. Bureau of Labor Statistics, Current Population Survey, 2004.

be attributed to a variety of factors, it is no coincidence that this period was concurrent with the resurgence in business influence in re-shaping the American workforce beginning with the election of Ronald Reagan as president in 1980 (Huntington 1981, Weir 1992).

2.1.2. Types of Unemployment

Unemployment can take various forms: a quick turnover from one job to another in pursuit of a higher salary; a temporary layoff as the economic cycle reaches its nadir; or a more prolonged period of joblessness which may result from a decline in a specific industry, such as textile manufacturing in Georgia. Unemployment is typically viewed by economists as arising from three sources: 1) short-term or frictional unemployment, 2) cyclical unemployment stemming from fluctuating aggregate demand by consumers whose appetites for goods and services vary over time and, 3) structural unemployment which arises when workers leave structurally declining industries (Hoque and Inder 2001). Each type of unemployment stems from distinctly different sets of economic and political circumstances and each suggests a different policy prescription for alleviation.

As Figure 2.2 illustrates, the unemployment rate varies cyclically with the business cycle, falling during periods of economic expansion (1993-1999) and rising during slack periods (2000-2003). The natural rate of unemployment coincides with the minima of the unemployment levels where inflation exerts upward pressure on worker wages. Structural unemployment is concentrated among certain industries (for example, manufacturing) and demographic groups (for example, blacks) and is longer-lasting than frictional or cyclical unemployment (Abraham 1983, Riddell 2000, Osberg 2004).

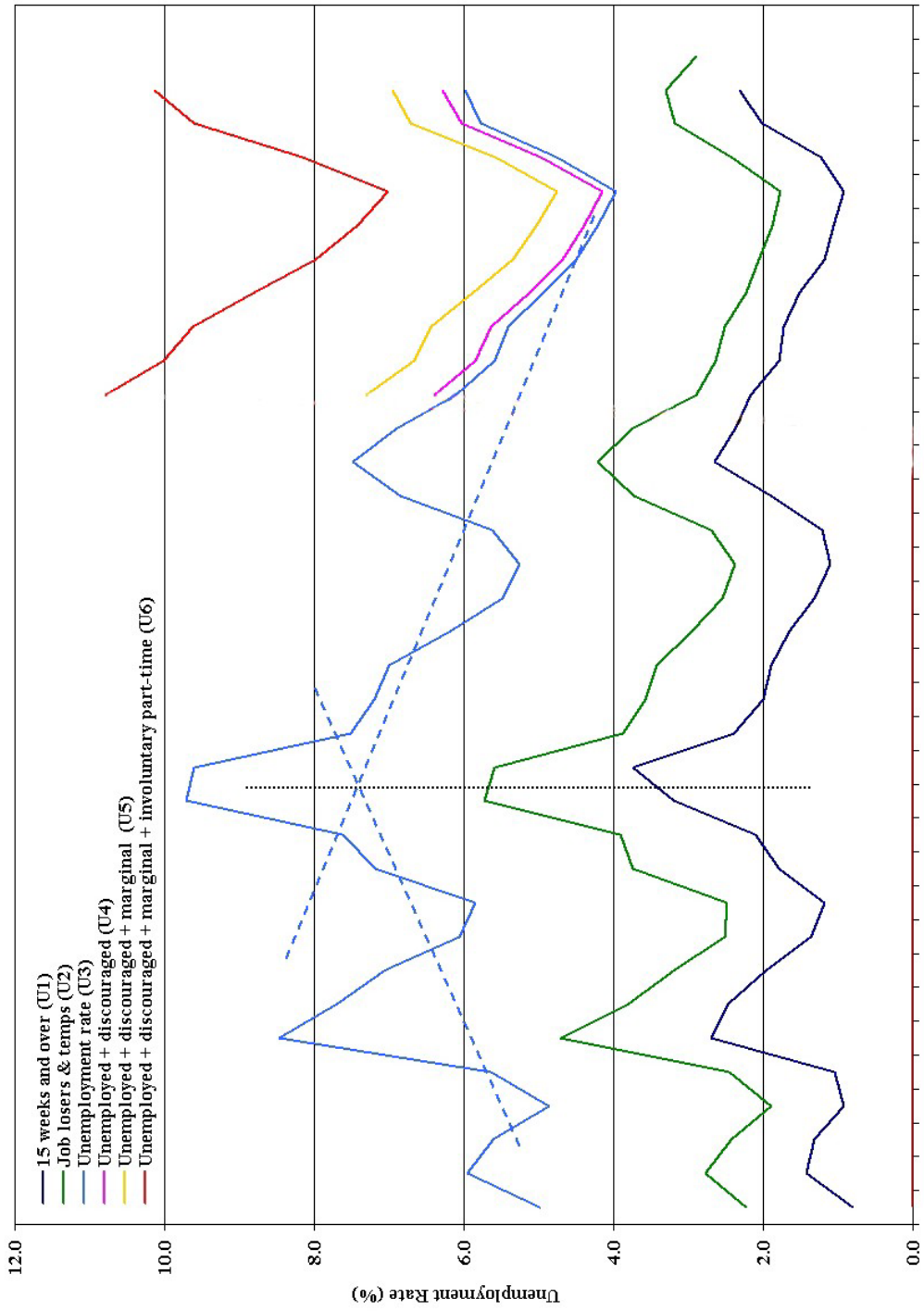

Figure 2.2. U.S. Unemployment Rates, 1970-2003
Source: Current Population Survey

Table 2.1 summarizes the three major types of unemployment and classifies each with respect to potential public policy remedies. Ranking high among potential responses are job search for frictional and cyclical unemployment and job training and education for the structurally unemployed.

David Lilien (1982) has argued that shifts in the sectoral composition of demand can have a significant effect on unemployment because labor resources are not instantaneously mobile across sectors. If workers were perfectly mobile across sectors then the average level of unemployment would not be affected by sectoral shifts. The aggregate demand and sectoral shift explanations for cyclical unemployment can have substantially different policy impacts and thus an understanding of the relative contributions of each is important in formulating policy responses to unemployment (Abraham and Katz 1986). Unemployment resulting from sectoral shifts is not amenable to correction by demand-deficient corrections such as fiscal and monetary stimuli. Instead, the traditional policy response to sectoral shifts relies on supply-side remedies such as job training and education.

Table 2.1. Types of Unemployment and Public Policy

Type	Duration	Policy
Frictional	**Short (1-2 months)**	**Job search**
Cyclical	**Intermediate (6-18 months)**	**Unemployment insurance, enhanced job search, fiscal stimulus and monetary policies, temporary public works**
Structural	**Long (6 months or longer)**	**Job training & education, jobs programs, relocation**

More extended job searches, from months to years, often arising from a mismatch between available jobs and worker skills, are associated with structural unemployment. Structural unemployment is important from a public policy perspective because a long-term disequilibrium between labor supply and demand can result in long-term unemployment, underemployment, and eventual withdrawal from the labor pool (Groshen and Potter 2003). Long-term unemployment, often assumed to be six months or more, is frequently associated with structural unemployment (Fortin 2000).

2.2. Long-term and Structural Unemployment: Trends and Evidence

2.2.1. Georgia Labor Force Flows

As workers transition between jobs in a market economy, some unemployment is inevitable, on average, about 15 weeks (CPS 2004). However, extended periods of joblessness are problematic for both the economy and individual. Figure 2.3 depicts flows into and out of the labor market for the state of Georgia for the month of September 2004[2]. Similar to the U.S. as a whole, the 4.4 million employed Georgia workers comprise almost two-thirds of the workforce with most of the remainder not in the labor force. By definition, 186,469 unemployed Georgia workers had jobs within the last six months and were actively seeking new employment. The unemployed

[2] The U.S. Bureau of Labor Statistics (BLS) publishes monthly unemployment statistics as part of the Current Population Survey (CPS). The CPS utilizes a working definition of unemployment that counts persons 16 or more years old and not institutionalized (prison, mental hospital, etc.) as either being "in the labor force (LF)" or "not in the labor force (NLF)." Active duty armed forces personnel are excluded but college students are included. According to the CPS definition of employment, a person working more than one hour for pay in the week surveyed or 15 hours in a family business is considered employed. A person is considered unemployed if they are not working but would take one if offered and have actively sought work in the last four weeks prior to the survey week. Though looking for work within the last year, "discouraged" workers are not currently looking for a job but would take one if offered.

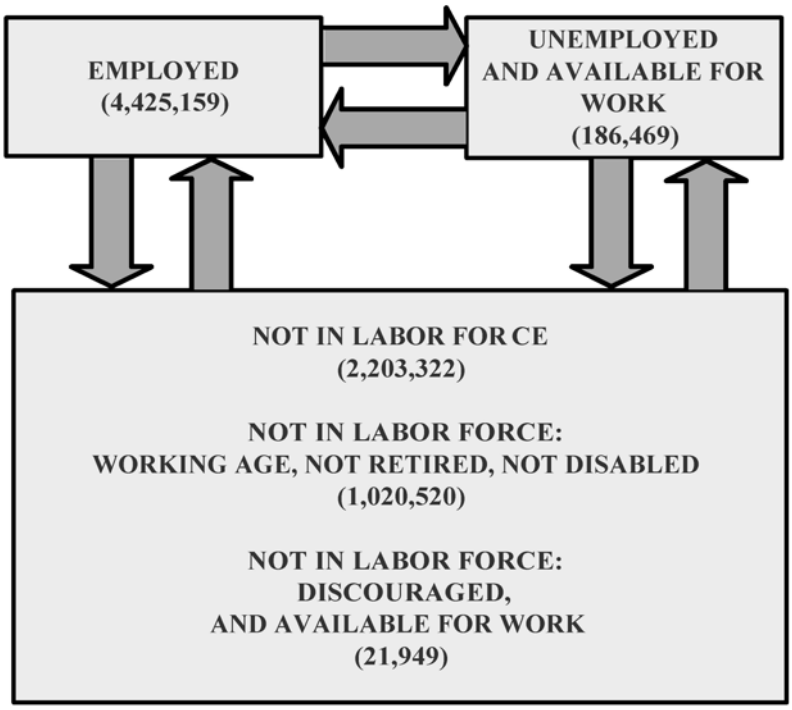

Figure 2.3. Georgia Labor Force Flows
(September 2003 Current Population Survey)

were a varied group including the short-term frictionally unemployed and longer-term workers. When non-working age and disabled persons are removed from consideration, the number of not-in-the-labor force falls by half, to about a million potential workers. Of this number, only 22,000 have been so unsuccessful in their job search that they have become discouraged, not actively looking for work but available if they somehow found a job. The overall picture is one of low unemployment with only about four percent of Georgians in need of a new job. As for the 22,000 discouraged workers, some from structurally declining industries such as textiles, finding employment has been very difficult. The dynamics of long-term unemployment change over time as technology transforms job content, the demographics of the workforce vary, labor market institutions evolve, and returns to nonworking change (Mocan 1999).

2.2.2. The Duration of Unemployment

The characteristics of unemployment can change over time as technology transforms job content, as the demographics of the workforce vary, as labor market institutions evolve, and due to changes in returns to nonworking (Mocan 1999). Levels of long-term unemployment generally continue to increase beyond the end of recessions, persisting for more than six months after the 1973-75 and 1981-82 recessions before beginning to drop, longer after the 1990-91 recession (a year), and even longer after the 2001 recession. For the long-term unemployed, a sustained recovery is necessary before levels begin to fall. For the structurally unemployed, even economic recovery may not be sufficient to regain employment.

Empirically, one of the most important aspects of the duration of unemployment is its long-term rise. Jared Bernstein of the Economic Policy Institute, examining data from the U.S. Census, found that nationally, the duration of unemployment increased from 12.4 weeks in 2000 to 17.9 weeks in 2002 (Bernstein 2003). Over the same period, the percentage of unemployed out of work for six months or more increased from 11.1 percent to 20.9 percent. In 2003, the proportion of the long-term unemployed increased to 21.8 percent, up from 18.3 percent the year before (Stettner and Wenger 2003). Since 1966, long-term unemployment reached a higher level only once, in 1983 (23.9%), in the aftermath of back-to-back recessions in 1981 and 1982 (Allegretto and Stettner 2004).

Since 1975, the average duration of unemployment in the U.S. has risen 22 percent, from about 14 weeks to 16 weeks with long-term unemployment greater than six months presently accounting for 30 percent of all unemployed workers in Georgia (CPS, Figure 2.4). While ordinary unemployment eases months after a recession ends, long-

term unemployment can continue for much longer periods of time, averaging 15 months in the early 1990s and at least two years in the early 2000s (Ilg 1994). Sluggish job growth in the early 1990s and 2000s has accounted for the slow uptake of long-term unemployed workers into the workforce (Groshen. & Potter 2003, Stettner & Wenger 2003). Many workers line up new jobs before quitting the old one but 40 to 50 percent do not, leading to longer periods of unemployment (Mattila 1974). With more workers taking longer to find jobs, the factors influencing job search—the number of available

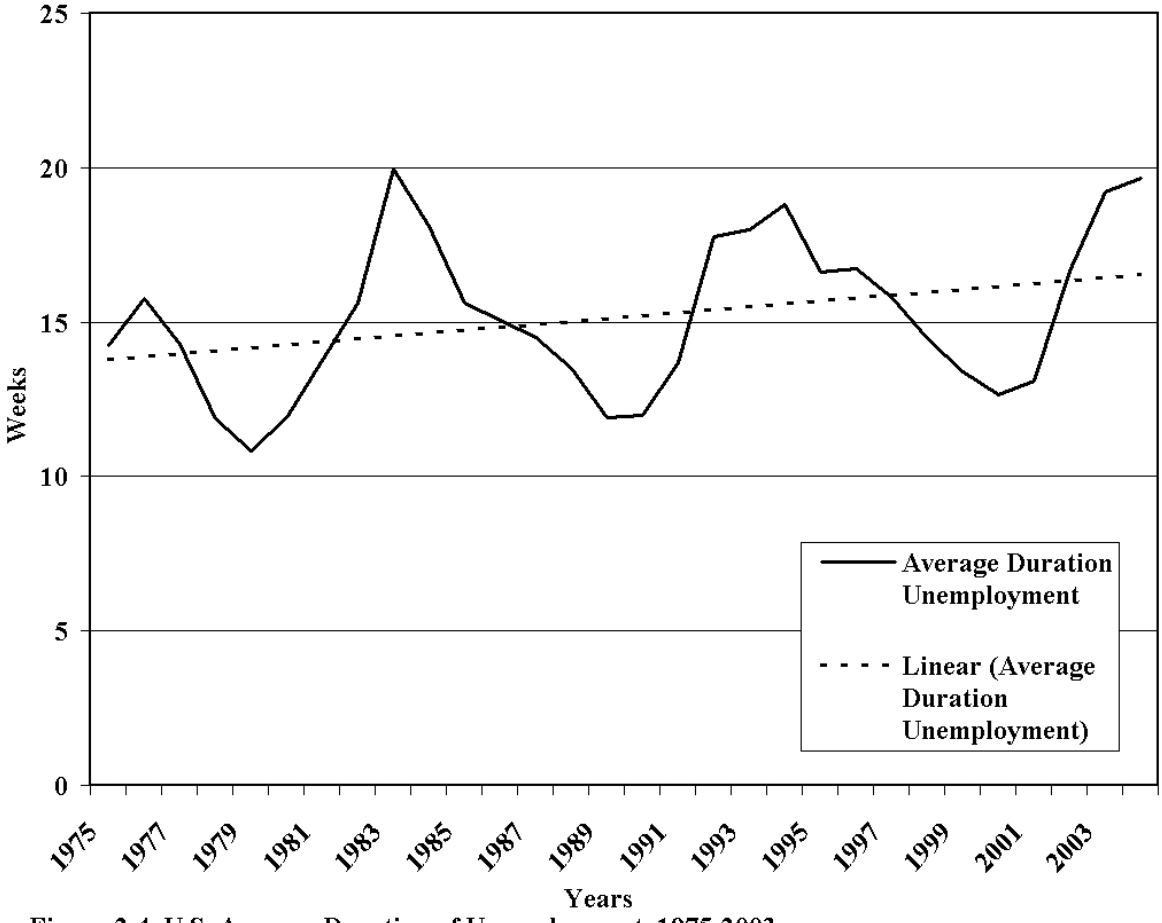

Figure 2.4. U.S. Average Duration of Unemployment, 1975-2003
Source: Current Population Survey

jobs, availability of accurate search information, high reservation wages, receipt of UI benefits, and the worker's age—become more important to understanding long-term unemployment (Becker and Hill 1980, Holzer 1985).

In October 2004, Georgia CPS data (Figure 2.5) shows that many workers, once they became unemployed, had difficulty in finding a new job. In fact, 29.4 percent of unemployed workers had been out of work for 26 weeks or longer, and almost twenty percent had been jobless for at least a year. Long-term unemployment in Georgia is not confined to a few workers at the periphery of the workforce but is a significant problem to almost a third of all Georgia's jobless. Re-employment is an evident challenge to these

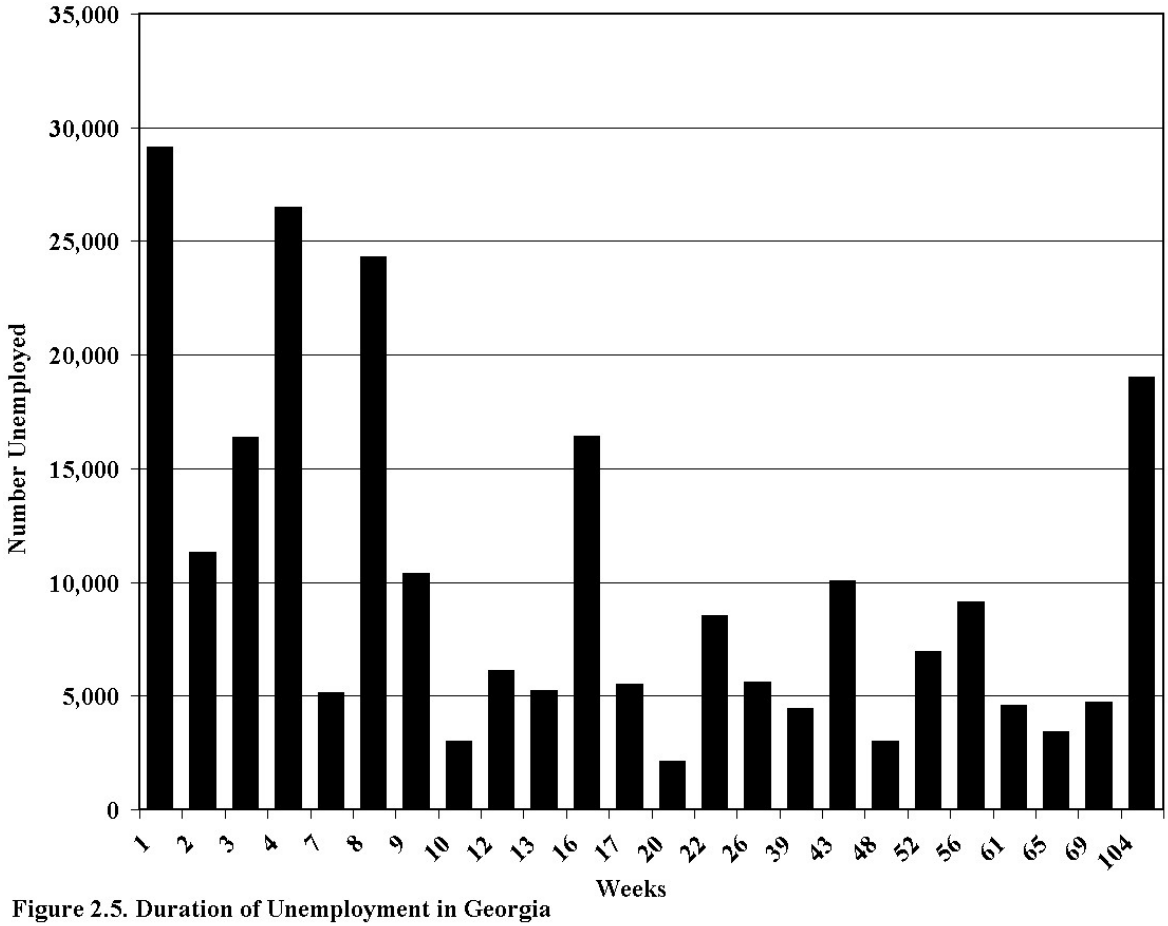

Figure 2.5. Duration of Unemployment in Georgia
Source: Current Population Survey, October 2004

long-term jobless workers and job training can potentially improve the match between worker skills and the skill content of available jobs. The increasing duration of unemployment is consistent with a view of growing structural dislocations in the state and national economies.

2.2.3. Influence of Sectoral Shifts on Unemployment

Persistent joblessness can be a reflection of structural issues with the economy. As Hyclak noted, "Structural changes in the demand for labor can be measured by employment shifts across sectors using establishment-level data on job creation and destruction" (1996). He found that most job turnover, 70 percent, occurred in identically sized firms in the same industry. Significantly, an important structural component was found, ranging from 4.1 percent in the West to 9.6 percent in the Midwest during the 1980-1984 recessionary period. Hyclak determined that the rate of structural changes in labor demand across industries was significantly linked to higher unemployment rates. If growing levels of long-term unemployment can be attributed to extensive structural changes in the economy, then joblessness will be most intense in those sectors in which the adverse impacts are strongest. Nationally and in Georgia, consumer and producer demand has increasingly shifted from goods to services, prompting sectoral employment shifts from goods-producing industries to more labor-intensive service industries (GDOL 2004, Hoque and Inder 1991).

As can be seen in Figure 2.6, the proportion of service jobs compared to other sectors in Georgia was high and rising over the 1999-2004 period with over 80 percent of the working population employed in services in 2004. Figure 2.6 plots sectoral trends in Georgia for industries other than services because the employment contribution from

services was so high (see title block) that it would not fit conveniently on the graph. During this period, employment in Georgia's other industrials declined for the most part. Goods-producing and the manufacturing industries were shedding employment, much of it moving to services. National trends mirrored Georgia's experience. On average, jobs in service industries paid significantly less well than jobs in manufacturing (Strawn 2000).

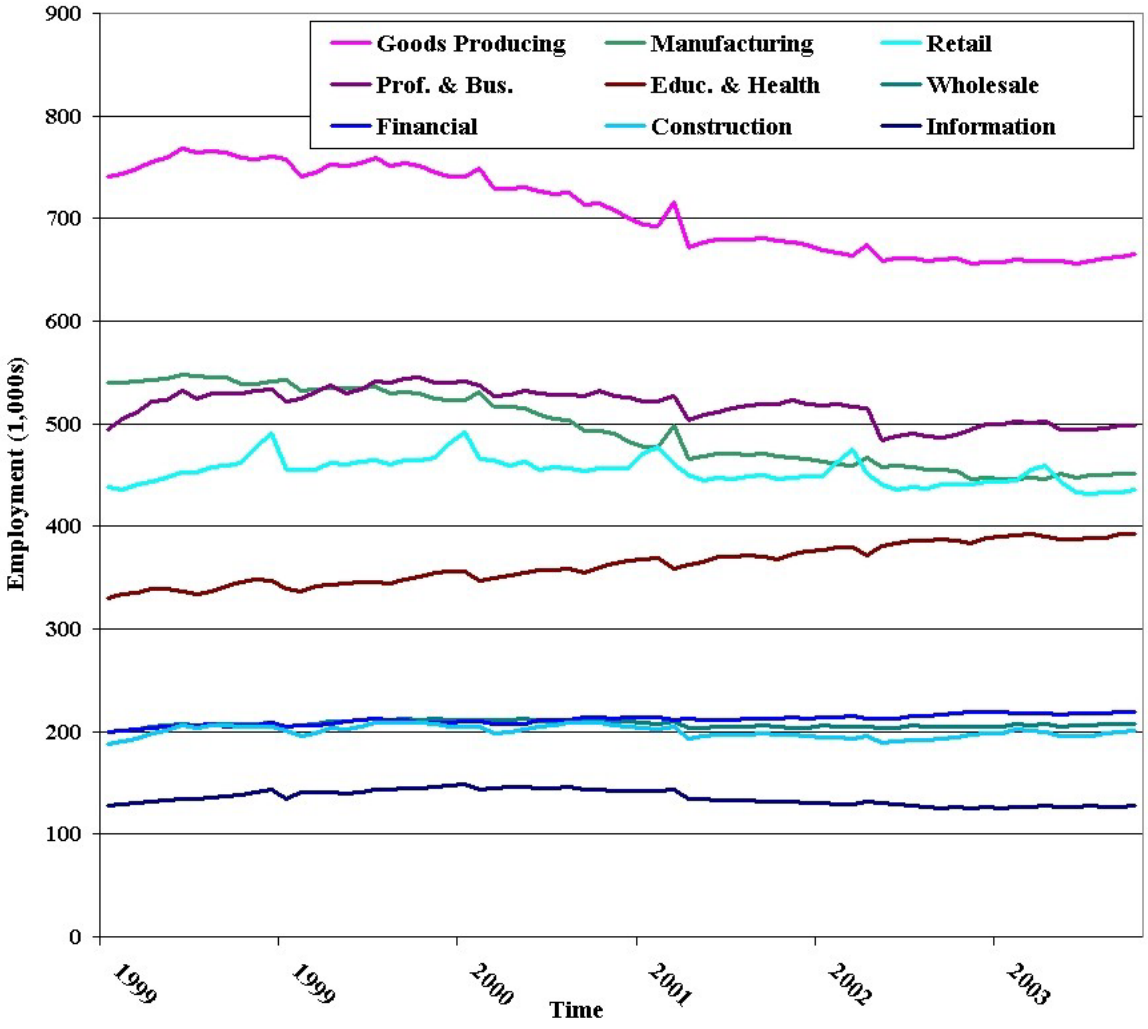

Figure 2.6. Georgia Sectoral Employment Trends, 1999-2003
(Service Sector Not Shown: Employment 3,000-3,250)
Source: Current Population Survey

2.3. Theoretical Perspectives on Unemployment and Job Search

2.3.1. Long-term and Structural Unemployment

Between the early 1950s and the mid-1980s, national unemployment steadily increased, apart from cyclical variations. In the early 1960s, Charles Killingsworth advanced the idea that this upward trend was due to a structural imbalance between supply and demand in the labor market because worker skills in certain sectors were becoming obsolete as technological innovation raised the skill requirements necessary for many occupations (1966). While other factors—unrealistic expectations regarding job search, a high reservation wage, marginal attachment to the workforce--can explain some proportion of long-term unemployment, structural unemployment, especially by involuntarily jobless workers, likely accounts for much more (Mocan 1999). In the intervening years since Killingsworth's work in 1966, many economists have shied away from structural explanations of unemployment favoring cyclical factors instead, particularly as unemployment falls during flush times (Lafer 2004)[3].

Using simple time-series models of layoffs and unemployment, David Lilien determined that most of the unemployment fluctuations in the 1970s were induced by structural shifts in the national economy (1982). His research supported the hypothesis that a significant proportion of cyclical unemployment in the post-World War II economy could be explained by the slow adjustment of workers to exogenous shifts in sectoral

[3] Interestingly, many fewer references for structural unemployment exist in the American academic literature as compared to European journals. But the American popular press has been much more generous in their coverage of structural unemployment compared to cyclical unemployment. A web search on the search engine Google in November 2004 found twice as many responses for the search term "structural unemployment" compared to the search term "cyclical unemployment." Virtually all the structural unemployment responses were from the popular press.

employment demand. Lilien was pessimistic that demand-stimuli such as aggregate fiscal and monetary policies were adequate to stanch the high unemployment rates of the 1970s, as the source of the problem was structural. He recommended supply-side labor policies such as job training and education that would ease the transition of workers from declining to growing sectors of the economy.

The aggregate demand and sectoral shift explanations for unemployment can have substantially different policy impacts and, thus, an understanding of the relative contributions of each is important in formulating policy responses to unemployment (Abraham and Katz 1986). Unemployment resulting from sectoral shifts is not amenable to correction by demand-deficient correctives such as fiscal and monetary stimuli. Instead, the traditional policy response to sectoral shifts relies on supply-side remedies such as job training and education.

2.3.2. Job Search Theory

Extended job searches, from months to years, often arising from a mismatch between available jobs and worker skills, are associated with structural unemployment (Riddell 2000). Structural unemployment is important from a public policy perspective because a continuing disequilibrium between labor supply and demand can result in long-term unemployment, underemployment, and eventual withdrawal from the labor pool.

For most workers the duration of job search is closely tied to the availability of suitable jobs. Except for workers who immediately transition to a new job, some period of unemployment is inevitable when changing jobs. Job seekers use imperfect information about the labor market in search of new employment, often consulting sources of information on job vacancies or traveling from firm to firm. George Stigler

theorized that job seekers invest resources, mainly time, seeking new or better employment until the cost of searching and being unemployed outweigh the estimated benefits of continued search (1962). The length of job search is determined by the size of the financial burden a prospective searcher is willing to pay before a job offer has to be accepted (Weiler 2001). John McCall (1970) developed an alternative view of job search that depends on a worker's minimum acceptance wage, or reservation wage, the lowest wage a worker is willing to accept to work a particular job (Kiefer 1979).

The Stigler and McCall models of job search both recognize that workers invest personal resources to acquire better employment. The length of job search, and unemployment for all but already-employed workers, depends on their estimates of the potential payoffs for this investment.

2.4. The Demographics of Unemployment

From the 1960s though the 1980s the national unemployment rate grew steadily but the sources of joblessness changed (Podgursky 1984). The influx of women and youth into the labor force in the 1970s was one reason for rising unemployment during that period. There are differing explanations as to why different demographic groups experience different levels of unemployment.

As Kaufman noted, "What appears to be taking place is a worsening unemployment problem among certain groups in the labor force, particularly blacks, teenagers in the 1970s, and adult men in the 1980s" (1984). These trends have continued into the 1990s and 2000s with continued adverse consequences for blacks and adult men (Allegretto and Stettner 2004). New factors, such as the decline of high-tech employment, a high volume of large plant closings, and intensifying offshoring have

aggravated the problem of structural unemployment among diverse demographic groups (Stettner and Wenger 2003).

Between 2000 and 2002, the relative share of long-term unemployment fell 4.1 percent for younger workers age 16-24, fell for less educated workers with only a high school degree or less (8.4%), and fell also for black (3.8%) and Hispanic (5.4%) workers. Figure 2.7 graphically illustrates these trends showing a long-term convergence in unemployment rates among whites, blacks, and Hispanics. The proportion of long-term unemployed among older, white and educated workers is growing relatively more quickly

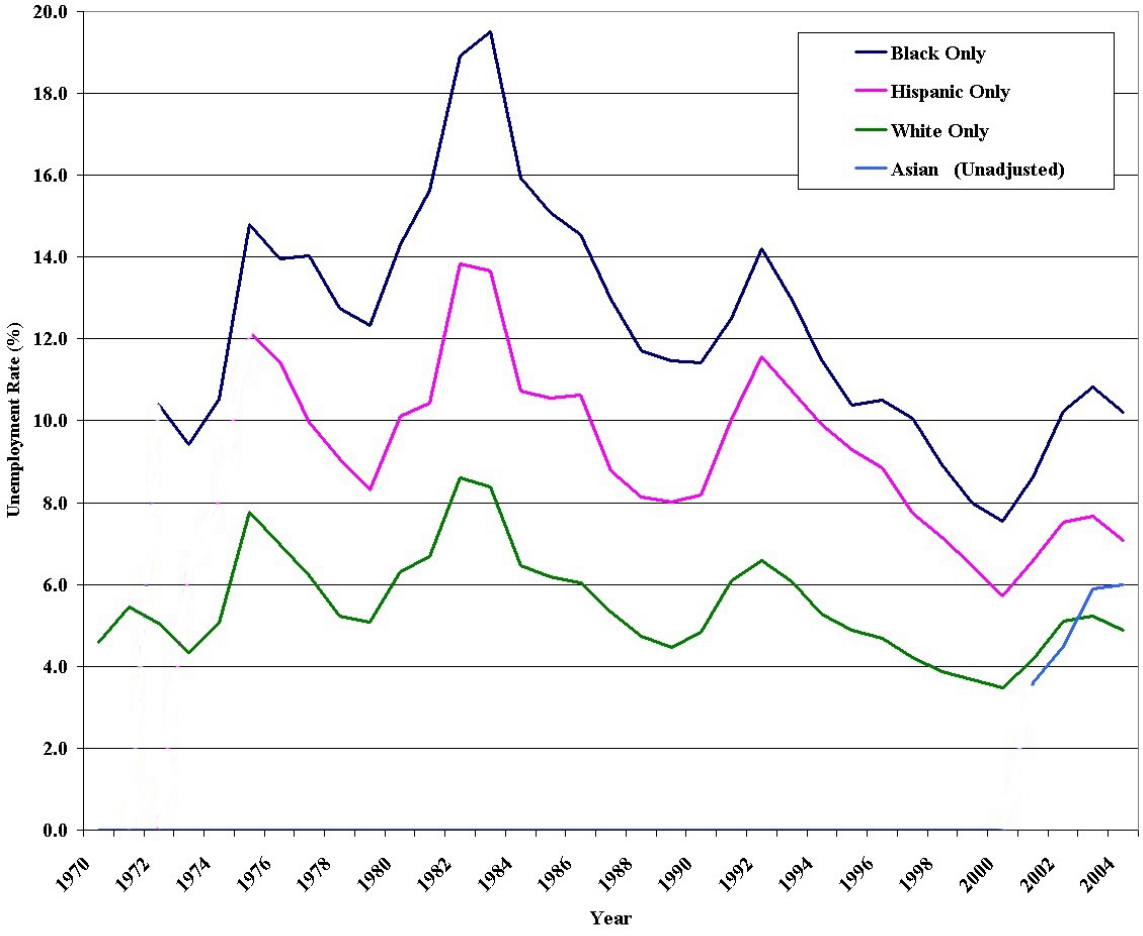

Figure 2.7. U.S. Unemployment Rates by Race/Ethnicity, 1970-2003
Source: Current Population Survey

than other groups, reflective of on-going demographic and structural shifts in the economy (Lynch 1994).

George Perry argued that most unemployment occurred from high rates of turnover, especially by women and minorities. Their more frequent spells of unemployment led to higher unemployment rates resulting from frictional turnover (1972). In this view, unemployment arises from the characteristics of workers, not from a lack of jobs in the economy. Thus, relatively higher unemployment rates for blacks can be explained by more frequent spells of joblessness rather than longer spells (Hall 1972).

An alternative to the turnover view was offered in the late 1970s by Kim Clark and Larry Summers (1979) and George Akerloff and Brian Main (1980) who found that joblessness tends to be concentrated among a relatively small number of long-term unemployed workers. In this view, unemployment rates are driven primarily not by the frequent frictional spells of large number of unemployed workers but by a lesser number of longer-term unemployed workers. Most unemployment is incurred by the relatively few long-term unemployed, not by the greater number of shorter-spell jobless workers.

2.5. Programmatic Strategies for the Alleviation of Unemployment

2.5.1. Overview of Workforce Development Strategies

Programmatic strategies for alleviating unemployment have evolved as guiding philosophies shifted from labor market interventions such as creating public jobs to an emphasis on personal responsibility for reattachment to the private workforce (Plastrick, et al. 2001). Discussions of labor market imperfections such as unemployment have increasingly come to emphasize shortcomings of the individual as causative, ignoring potential structural economic explanations (Lynch and Hyclak 2001). Unemployment is

viewed either as a function of cyclical economic factors and not underlying structural problems in the labor market or is presumed to stem from either a lack of desire to work for prevailing ages, a lack of information about job possibilities, an individual preference for leisure, or an unwillingness to relocate to job-rich areas (Hoque and Inder 2001). In this formulation, unemployment is not a problem that policy can effectively address aside from job search and comparatively modest retraining programs.

2.5.2. The Evolution of Federal Job Training Programs

The first major federal job training program was the Manpower Development Training Act (MDTA) of 1962 and was intended to retrain workers displaced by industrial automation (Borus 1978). Emphasis on retraining soon shifted to severely disadvantaged workers when the U.S. Department of Labor determined that structural unemployment was a much greater problem than the frictional unemployment experienced by skilled workers displaced by technology (Bartik and Hollenbeck 2000). During the 1960's and '70s, both Democrats and Republicans found a broad consensus on elements of labor policy: full-employment, improving job search information, job training, reducing turnover, and an emphasis on alleviating middle class unemployment (Lafer 1994). This consensus fell apart in 1972 when President Richard Nixon began a legislative decentralization-devolution process to states and localities. The MDTA program was replaced in 1973 by the Comprehensive Employment Training Act (CETA) program which decentralized administration and introduced a public service employment program element (Ginzberg 1996).

In 1978 during the Carter administration, CETA focused on the structurally unemployed and the poor (Dickenson 1986). Originally, CETA had a large training

component but the sharp increase in joblessness in the mid-1970s shifted the program to creating public jobs. Conservative criticisms of "wasteful big government" became politically popular so employment initiatives such as CETA lost public support. Importantly, employment programs became more racially focused and remedial, dividing the black unemployed from the white unemployed in the political debate about unemployment (Weir 1992). In his last two years in office, President Carter cut the size of the CETA program and directed it toward the poorest unemployed, a shift which persists to the present.

The emergence of an anti-big government consensus in the late 1970s and early 1980s, and still in force today, constrains workforce policy planning options, essentially leaving the problem to free-market forces. In this period, academic research in employment policy has shifted from a middle-level of research concerning industrial sectors and labor market institutions to macroeconomic forces on the economy at large (Weir 1992). Academic economists began to move away from institutional thinking and began to focus on abstract mathematical analysis from the neoclassical school, avoiding contentious political issues like structural unemployment.

During the Reagan administration, CETA was replaced by the JTPA (Jobs Training Partnership Act) and funded at relatively low levels, indicative of the smaller role of government in employment policy (Edsall 1984). The JTPA took effect in October 1983 and provided job-training services for economically disadvantaged adults and youth, dislocated workers and those facing significant employment barriers (Bartik and Hollenbeck 2000). JTPA was designed to move jobless workers into permanent, self-sustaining employment, and to improve participants' wages. The JTPA was designed to

overcome public skepticism about publicly funded job training programs by having no job creation component and by shifting program execution to private industry councils (PICs) that were dominated by individuals from the private sector.

In 1998, Congress passed the Workforce Investment Act (WIA) which replaced the JTPA. Like the JTPA, WIA programs are nominally under the direct control of local private sector boards. Similar to the JTPA in terms of training and educational opportunities, the WIA's major innovation was administrative rather than substantive introducing training vouchers (Individual Training Accounts) that ideally permit well-informed trainees to shop for the best instruction available (Buck 2002).

From the 1960s to the present, federal workforce development philosophy has evolved from job training initially targeted on structurally unemployed workers leaving declining industries (MDTA and early CETA) to a *de facto* social service delivery system (late CETA, JTPA, and WIA) focusing on groups with marginal attachment to the work force such as minorities. This shift in emphasis has left the structurally unemployed suffering from the sectoral shift from manufacturing to services, many of them very experienced workers with job skills no longer in demand, with few options in a job training system designed for minorities experiencing long-term unemployment because of systematic racial and other types of discrimination.

2.5.3. Current Workforce Development Strategies

2.5.3.1. The Workforce Investment Act (WIA) Program

The U.S. Department of Labor's Workforce Investment Act (WIA) Program has established "One-Stop" Centers as a central focal point for all job-related activities including job training and human support services (GDOL 2004). There are currently

over 45 full service WIA One-Stop Centers in Georgia. In addition to these full-service sites, many communities have satellite locations for customers to access workforce services. These service sites may include libraries, technical colleges, welfare offices, community centers, or mall kiosks, and may provide limited services, or services for specialized populations (Berkeley Policy Associates 2003, Fitzgerald 2000). Not all WDS facilities offer a full-range of instructional courses, creating a potential mismatch between new students and their desired courses of instruction. Title I of WIA includes adult, dislocated worker, and youth employment and training services, in effect continuing the JTPA "second chance" job training program (Bartik and Hollenbeck 2000). The WIA program provides eligibility for core services to all adults aged 18 and older. Adult, Youth, and Dislocated workers fall under Title I of WIA.

The WIA program offers a pathway to create systems change within a context of existing programs and facilities (Giloth 2000). The WIA Program is unique with statewide geographical coverage and access to government funding flows. Unfortunately, much of the funding for the construction and staffing of One-Stop Centers came at the expense of existing services (Lafer 1998). Priority for intensive and training services is given to recipients of public assistance and other low-income individuals. WIA excludes the long-term unemployed from definition of dislocated worker.

The Georgia WIA (GDOL 2004) plan builds on the system of workforce development services currently provided through the state's technical colleges and the GDOL One-Stop Career locations, local WIA programs and vocational rehabilitation services. The One-Stop system actually functions on two levels: the electronic infrastructure developed by the Georgia Department of Labor (GDOL), and the service

delivery system created across the state by state and local partner organizations. However, complete implementation of a fully integrated statewide workforce development system is still a work in progress. While the national WIA program has centralized client intake, the services offered by the One-Stop Centers have not been well integrated in terms of participating agencies and funding streams (Giloth 2004, O'Shea and King 2001).

2.5.3.2. The WIA Program's Work-First Philosophy

The WIA operational philosophy is based on immediate work activity as its highest priority. Skills development through occupational training is available to only an limited number of individuals (Bartik and Hollenbeck 2000, Workforce Alliance 2002). The WIA "One-Stops" provide core services which provide access to job listings to all individuals but involve minimal support. If local resources are available, individuals who do not find employment after core services may be eligible for intensive services which include a voucher to be used for training (USDOL 2002).

Many workforce development professionals regard WIA's framework of tiered services to be a "work first" system, in which skills training is a last option, available only after other services have failed repeatedly to help someone secure a steady job (Smith 2002). An alternate strategy would move clients through the service tiers into skill-based training as quickly as possible, so those who can benefit from training can do so, thereby improving their chances of finding a decent job when they go out into the labor market (Workforce Alliance 2003).

2.5.3.3. The Tiered Delivery of WIA Training Services

Most WIA services are divided into three tiers: core, intensive and training. Participants must utilize the services in one tier before moving to the next (Berkeley Policy Associates 2003)

1. Core Services--One-Stop operators provide job search and placement assistance, information about the local labor market, job banks, support services, information on filing for unemployment compensation, and performance and cost information on eligible training providers.

2. Intensive Services--Participants can only access intensive services after failing to gain employment through core services. Intensive services include comprehensive and specialized assessment of skill levels, development of individual employment plans (IEPs), case management and short-term pre-vocational services, any of which may be delivered by the One-Stop operator or through contracts with service providers.

3. Training Services--Employer-linked programs and classroom-based skills training leading to a specific occupation are only available to individuals who have failed to obtain employment through core and intensive services. (Workforce Alliance 2003). Training programs include occupational training, on-the-job training, skills upgrading and job readiness delivered by service providers meeting the eligibility requirements (Public Private Ventures 2002).

2.5.3.4. How Has the WIA Program Worked In Practice?

Nationwide, implementation of the WIA program has had positive impacts in some areas, including expansion of publicly available information systems and improved access to the local workforce development planning process by the private sector.

However, there are important areas in which WIA has not achieved its objectives, and in some cases has actually reduced opportunities for local workers to develop the skills demanded by local employers (The Workforce Alliance 2003).

Training has become less of an option for job seekers under WIA than it had been under JTPA. As mentioned, tiered service delivery has led many states to adopt a "Work First" approach to WIA that limits training for a wide range of workers, including the recently laid off. Many One-Stops have effectively relegated training to a "last resort" for their clients. (The Workforce Alliance 2004). Lastly, because TANF was not included as a mandatory partner agency under WIA, many One-Stops have excluded TANF recipients from access to training services (The Workforce Alliance 2002, W. K. Kellog Foundation 2004).

2.5.3.5. WDS Funding Constraints

Funding constraints on the U.S. Department of Labor's workforce programs have increasingly limited access to job training and education programs (Mulhausen 2002). Spending on JTPA/WIA programs dropped by 29 percent between 1985 and 2003 in inflation-adjusted dollars (Workforce Alliance 2003). Funding has shifted from education and training to work first activities geared toward quick employment (Spence 2003, Atkinson 1998). Even dislocated worker funding, after years of increase, has fallen by 15 percent since 2000. Funding on other job training programs has decreased including the HHS Job Opportunity and Basic Skills (JOBS) Program and DOE's Perkins Vocational and Technical program. While funding under the U.S. Department of Education's Pell Grant program has grown, the supply of students has far outstripped funding. It is very questionable whether available WDS funding matches the number of

potential unemployed trainees (Spence 2003). Historically, and continuing to the present, GDOL job service programs draw on an array of fragmented, separate funding streams subject to the vagaries of the Congressional budgeting process. The "triage" approach of the WIA's tiered access to job training services, which minimizes access to the more expensive training services such as factory or assembly line skills training, is well suited to a funding environment with chronic budget constraints.

2.6. Approaches to Job Training

2.6.1. The Role of Job Training in the Educational System

The institutional response to unemployment in the public sphere in the U.S. has been job training and educational programs. In Georgia, as in other states, the responsibility for job training rests primarily with the Departments of Labor, Education, and Technical and Adult Education. Georgia's Workforce Development System (WDS), nominally a partnership of these and other government agencies, offers instructional activities throughout the state to a diverse population including young people who missed out on the "first chance" system, workers laid-off from large plant closings, and the persistently unemployed located in some central city and rural areas. The important question addressed in this research is whether the WDS, as currently constituted, has the capability of adequately educating and assisting the unemployed, particularly the persistently jobless, to find long-term, stable employment.

Traditionally, the unemployed have had a "second chance" education and training system—high school equivalency degree (GED), English as a second language (ESOL), and many forms of job training —to upgrade skills if they had missed out on the "first chance" system of high schools and vocational-technical schools (Bartik and Hollenbeck

2000). The historical focus of "second chance" education and training has been on returning unemployed blue-collar workers to the workforce. The second chance system has been criticized for a lack of coherence; in Giloth's words (2004), "a fragmented hodgepodge of programs." While the second chance system works for some, many participants, often low wage and lesser skilled, do not derive economic benefit from these programs (Giloth 2004).

2.6.2. Job Training Services

One reason that the second chance system is often not beneficial for workers is that effective training requires as much as 1,000 hours of basic education and training to advance to the advanced skills levels required for economic independence (Carnevale and Reich 2000). The WIA "Work First" philosophy requires that participants receive core and intensive job training services in which minimal training is received before more advanced courses of instruction with the potential for more beneficial results can be accessed (USDOL 2000). The time cost of the Tier 1 and 2 services is relatively small; less than a few hours per client. Apart from the "Work First" approach, many workers are not convinced that such a large expenditure of time and effort on their part will result in sufficient improvement in skill levels, and commensurate pay, to warrant such an investment (Carnevale and Reich 2000).

The skills obtained through job training range from the Tier 1 and 2 "soft skills" such as employability skills, basic academic skills such as verbal and numeric literacy, to Tier 3 industry-specific skills such as metalworking and nursing (Bartik and Hollenbeck 2000). Many employers need workers with "soft skills," especially those in occupations which require interaction with the public (Whiting 2004). Even the higher-level technical

skills, such as for factory floor jobs, require "soft skills." Funding training in generic skill areas promotes the transferability and thus potential spillover benefits to other employers. While spillover effects are beneficial to society at large, they are not attractive to firms looking to capture the full value of their training expenditures. Employability skills and basic academic skills are productive in their own right but most often do not provide push workers up the economic ladder (Bartik and Hollenbeck 2000, Whiting 2004). Though "soft skills" are necessary for lower-level jobs such as restaurant work, it is the technical skills that have the potential to provide workers a decent wage.

2.7. Previous Job Training Program Studies

2.7.1. Previous Job Training Programs Characteristics and Impacts

Barnow documented the hundreds of evaluations that, as of the 1908s, have been performed by researchers to assess the performance of job training programs (1987). Decades of studies have not produced a broad consensus about the efficacy of job training programs for raising worker wages or for shortening the time before re-employment is achieved. The reasons for this are numerous: a constantly changing economy affects the demand for many occupations, changing technology affects optimal production methods and labor intensity, poverty and unemployment can be strongly related, and many others. The current approach to providing job training services should be understood within the context of previous programs so that insights regarding WIA program operations and limitations may be gained.

2.7.1.1. The Manpower Development and Training Act (MDTA) and The Comprehensive Employment Training Act (CETA)

LaLonde's comprehensive review of studies of the Manpower Development and Training Act (MDTA) job training program and the Comprehensive Employment Training Act (CETA) program, found estimates that ranged from slightly negative or small earnings gains to large earnings losses, depending on the study (1995, Bryant 1987). Table 2.2 draws on data from LaLonde and other authors to show the effects of MDTA and CETA job training programs on economically disadvantaged[4] participant wages. The non-experimental nature of the data required the studies to make specific assumptions about selection procedures used to determine which individuals received training. As LaLonde noted, the inability to adequately test the validity of selection processes made it difficult to determine which studies, if any, modeled the process correctly (LaLonde 1995).

Overall, the programs were found to be more effective for women than men, and public service employment and on-the-job training were generally found to be more effective activities than classroom training and work experience (Walsh 2000). Annual earnings gains of as much as $2,913 (males) and $2,781 (females) were found by Ashenfelter in his 1976 CETA study. His 1964 study of the MDTA programs also found positive wage impacts, at least for white females ($1,740). The results found by

[4] Under JTPA and similar job training programs, "economically disadvantaged" refers to "a individual that receives, or is a member of a family that receives, a total family income for the six month period prior to application, which does not exceed the poverty level established by the Office of Management and Budget (OMB) or 70 percent of the Bureau of Labor Statistics (BLS) lower living standard, whichever is greater. The JTPA defined a "dislocated worker" as a person who has been terminated or laid-off, cannot collect unemployment insurance because they are ineligible or have exhausted their entitlement, and are unlikely to return to their previous industry or occupation because of a permanent closing of their plant or facility (JTPA 1987).

Table 2.2. Effects of MDTA and CETA Job Training Programs on Participants' Earnings (post-training increase in earnings, non-experimental estimates, 1990 dollars)

Study	Program Year	Male (whites/minorities)	Female (whites/minorities)
Ashenfelter (1978)	MDTA 1964 Adults	$750 / $520	$1,740 / $1,540
Keifer (1979)	MDTA 1969 Adults	-$1,670 / -$1,850	$1,570 / $2,160
Gay and Borus (1980)	MDTA 1969-1972 Adults	$125 / $133	$1,132 / $311
Cooley et. al. (1979)	MDTA 1969-1971 Adults	$1,150	$1,680
Westat (1984)	CETA 1976 Adults	-$10 / -$210	$810 / $660
Bassi (1983)	CETA 1976 Adults	$50 / -$870	$1,060 / $2,200
Dickenson et. al. (1986)	CETA 1976 Adults	-$1,280	$20
Geraci (1984)	CETA 1976 Adults	$0	$1,670
Bloom/McLaughlin (1982)	CETA 1976 Adults	$300	$1,520
Ashenfelter / Card (1985)	CETA 1976 Adults	$160	$1,412
Ashenfelter / Card (1985)	CETA 1976 Adults	$2,913	$2,781
Dickenson et. al. (1986)	CETA 1/1976-6/1976 Adults	-$850	$450
Westat (1984)	CETA 1977 Adults	$930 / $1,220	$990 / $1,410
Bassi et al. (1984)	CETA 1877 Adults	$1,170 / -$190	$1,660 / $1,260
Cooley et. al. (1979)	MDTA 1969-1971 Youth	$1,230	$600
Gay and Borus (1980)	CETA 1969-1972 Youth	-$215 / $148	-$1,282 / -$325
Maller et. al. (1982)	CETA 1977 Youth	$1,600	$800
Dickenson et. al. (1986)	CETA 1976 Youth	-$1,110	$370
Bryant and Rupp (1987)	CETA 1976 Youth	$60	$60
Bryant and Rupp (1987)	CETA 1977 Youth	$1,050	$1,050
Bassi et. al. (1984)	CETA 1977 Youth	-$1,010 / -$1,330	$80 / $260

After LaLonde 1995

other workers were substantially smaller however, some even negative (Dickenson 1986). Bloom and McLaughlin found a $300 impact for men but a considerably larger $1,520 for females. More troubling were the small and even negative wages effects found by many of these workers. Kiefer determined that men, both whites and minorities, experienced -$1,670 and -$1,850 wages losses respectively. In contrast, Kiefer found the same MDTA female cohort has positive wage impacts of $1,570 and $2,160. Geraci (1984) Ashenfelter and Card (1985-1), Bryant and Rupp (1987, 1976) found small but positive wage effects. Dickenson (1986), Bassi (1984), Westat (1984), Gay and Borus

(1980) all found at least some negative wage impacts. In a similar survey, Barnow (1987) found similar modest earnings impacts among mostly the same studies including many statistically insignificant findings.

A remarkable feature of the studies is, despite broad overall agreement, they differed considerably in many of the specific impact findings. The results vary among different cohorts from year-to-year but it is noteworthy that even when evaluators analyzed the same cohorts, results were often significantly different. This array of findings occurred even though most of these empirical researchers used the same data (LaLonde 1995). Bryant and Rupp, who research findings appear in the Table 2.2 summary table, found that the variability in results between researchers were not due to sample error but in subtle differences among the statistical models used (1987).

2.7.1.2. National Job Training Partnership Act (JTPA) Study

The Job Training Partnership Act (JTPA) study was a large-scale, experimentally designed study commissioned by the U.S. Department of Labor and conducted from November 1987 to September 1989 (Orr, et al. 1996). Manpower Demonstration Research Corporation (MDRC) was the lead contractor hired to implement and monitor the experiment and Abt Associates led the effort to design the study, collect the required data and conduct the analyses. Larry Orr, et al., from Abt Associates, analyzed the findings of the largest, and perhaps most rigorous, evaluation ever done of job training programs designed to increase the employment and earnings of poor Americans.

Their study of sixteen National JTPA programs, which followed 20,000 applicants over a two-and-a-half year period, measured program effectiveness separately for adult men, adult women, female youth, and male youth. Findings were based on

survey data, administrative records, and data from both welfare agencies and the unemployment insurance offices. Their experimental evaluation, with rigorous control (untrained) and treatment (trained) group methodology, showed that participation in the JTPA increased the receipt of employment and training services, and, for females only, increased levels of educational attainment. Adult workers were found to benefit more than younger workers from job training. However, there were important outcomes that participation in the program did not affect such as short- and long-term earnings, and male educational attainment. The lack of income impacts for all participants, even for the women who measured a positive impact for education, suggests that the JTPA, and by implication the similar WIA program, can be of limited effectiveness, especially given the program's ambitious publicly-stated goals. (In contrast to the JTPA study, the WIA program, with its focus on immediate employment, not skills-based job training, has not been similarly evaluated.)

Participants were randomly assigned to control or experimental groups. Multiple regression analysis compared the impacts of JTPA graduates to those of similar workers who did not participate in the training and found no significant impact (significance level $p = .10$, two-tailed t-test) on total earnings for most groups including youth. There were no statistically significant impacts on long-term earnings of participants compared with the control group for any of the program's three service strategies. Lafer (2002) argues that even the minor positive impacts for adults in the JTPA program may have not been due to the impact of job training skills but rather job placement services.

Bloom and Orr (1995) found a variety of contradictory results, among them that the control group wage increases sometimes exceeded those of the treatment trained

group. One group, black males, experienced reduced wages by as much as 22 percent. As Bloom and Orr note, "…one cannot control directly for characteristics that affect labor market outcomes but that cannot be measured fully, such as motivation" and that "although a wide range of statistical matching and modeling procedures have been used to address the problem (of selection bias), no acceptable solution has been found" (pg. 8).

2.7.1.3. GAO JTPA Long-term Earnings and Employment Outcomes Study

After the National JTPA study delivered such disappointing results, the GAO conducted another study of the JTPA program and found that, "…we found no significant effect of JTPA on earnings or employment rates after five years" (GAO 1996. pg. 2). Like the National JTPA study, study participants were randomly selected to receive or not receive training services[5]. The GAO found that, generally, treatment group earnings exceeded that of the control group, but the lack of statistical significance of the JTPA training programs made conclusions and policy guidance infeasible. The lack of income impacts for all participants, even for the women who measured a positive impact for education, suggests that the JTPA, and by implication the WIA, are of limited effectiveness.

2.7.1.4. Center for Employment Training (CET)

The Center for Employment Training (CET), founded in San Jose, California, has perhaps the best record of job training program success, based on their JobStart Demonstration project (Walsh 2000). The original JobStart program of the CET in San Jose was one of the few bright spots in an otherwise disappointing history of employment

[5] The control non-training group was given a job training option after their participation in the study.

and training programs (Miller et. al. 2003). JobStart offered at least 200 hours of basic skills training and at least 500 hours of occupational skills training (Walsh 2000). The JobStart Demonstration sought to test whether an array of comprehensive employment-related services could be implemented within the constraints of the Job Training Partnership Act, and whether such services could produce gains in educational attainment, employment, earnings, and other outcomes. JobStart utilized a classic experimental design (Walsh 2000). Among 16 employment and training providers participating in the program, CET-San Jose alone produced statistically measurable employment and earnings gains for its clients (Walsh 2000). With JobStart, CET generated high earnings gains, over $8,000 (1998 dollars) during the second and third years after training because of higher wages and longer working hours (Smith 2002).

From the start, CET received strong support from Silicon Valley employers, and it was helped considerably by the fast growth and labor shortages of these firms. CET's training model incorporated many features including strong connections with specific industries in the design and implementation of the program, a type of sectoral strategy; short-term but intense training lasting 30 weeks, five days a week, eight hours a day; no screening of participants; training was open entry-open exit and was designed to provide participants with a "factory floor" environment. Perhaps most significant, participants immediately started to train for a specific occupation based on an individualized training program (Bartik and Hollenbeck 2000).

However, questions arose about the transferability of these results to other, less favorable, settings (Walsh 2000, Miller 2003). In the 1990s, the U.S. Department of Labor sponsored a large-scale replication of the CET program in many other cities across

the nation. The evaluation of the CET replication sites involved twelve locations of which six were chosen from eastern and mid-western states and six from the western states, mainly California. All the western sites were CET affiliates with the remaining sites operated by community-based organizations (CBOs) (Walsh 2000). An interim report showed that only a third of the replication sites were able to fully implement the CET model; the so-called "high-fidelity" sites (Miller et. al. 2003). Implementing the CET job training model across all the replication sites was difficult challenge given the variations in program implementation stemming from differing approaches to managing the sites.

The multi-site replication study sample included 1,485 (1,306 after a 30-month follow-up) participants between ages 16 and 22 (Miller, et al 2003). About half the participants were randomly assigned to the program group and received access to CET services, while the remaining participants were randomly assigned to the control group and were not given access to CET services. As with the JTPA and other job training studies, participants were able to enroll in other job training services. Survey respondents reported 218 hours of instruction for the high-fidelity sites and only 62 hours for the remaining sites (Miller, et al 2003).

Among sixteen employment and training providers participating in the study, CET-San Jose alone produced statistically measurable employment and earnings gains for its clients (Walsh 2000). This outcome was disappointing considering the strongly positive findings from the JobStart program. As implemented in the replication sites, the CET model had few statistically significant effects on earnings or employment during the first 30 months, even in the high-fidelity sites where the model was well implemented.. In the high-fidelity sites, the CET model led to a significant increase in earnings and employment for females but had the opposite effect for males (Miller, et al 2003).

Job training programs have typically had more success with women than men, and the CET sites were no exception. CET in the high-fidelity sites led to an increase in employment and earnings for females but had the opposite effect for males. Miller et. al. suggests that men have more barriers to employment such as prior arrest records or may simply be viewed by employers as more risky hires than females (2003). On average CET training reduced male employment which Miller speculates may be because males have a higher reservation wage, a prospect which may not materialize. In the high-fidelity sites, the multi-site evaluation showed that the two genders participated in different activities with more women participating in accounting and office training and more young men received training in non-clerical jobs, such as building and maintenance and metal trade. Women also trained for more hours, on average, than the men.

Table 2.7.1.5. California Greater Avenues to Independence (GAIN) Evaluation

California's Greater Avenues to Independence (GAIN) program began statewide operation in 1986. Focused on welfare recipients, the California GAIN evaluation tracked 33,000 participants in six counties: Alameda, Butte, Los Angeles, Riverside, San Diego and Tulare (Strawn 1998). Manpower Demonstration Research Corporation (MDRC) conducted this random sample study which compared treatment (trained) and control (untrained) groups. The GAIN results were very influential in the 1996 welfare reform act, which strongly emphasized "Work First" over skills training (Smith 2002).

In 2000, Stephen Freedman, et al., of MDRC, evaluated the Los Angeles Jobs-First GAIN Program and found meager results. In the mid-1990s, Los Angeles transformed its Greater Avenues for Independence (GAIN) program, which sent most welfare recipients to school to learn basic skills, into Jobs-First GAIN, a "Work First"

program that assigned most welfare recipients to job search and attempted to move them as quickly as possible into employment. The random assignment evaluation design began in 1996 and included nearly 21,000 single parents and members of two-parent households.

The Los Angeles GAIN increased two-year employment by five percentage points but failed to raise earnings by a statistically significant amount (Freedman 2000). At the end of the two-year follow-up period, many people were still jobless or employed in jobs that paid relatively little and offered few benefits, and there was little change in participants' total income. In MDRC's words, "these findings demonstrate… that there are no easy answers."

The Riverside GAIN program had a strong employment focus but also allowed participation in education activities (60 percent participated in education or training) (Martinson and Strawn 2002). Participants in Riverside's GAIN program had a substantial 15 percent increase in employment for the trained group of participants and earned $2,653 more than the control group (Freedman, et al 2000). According to Bartik and Hollenbeck (2000), California's GAIN program in Riverside succeeded largely because of the leadership that was exhibited. Similarly, the success of other programs has often been traced to the individual program administrators. When leadership is a decisive determinant of program outcomes, replication is problematic.

The differences in outcome impacts between the Los Angeles and Riverside programs resulted from differences in implementation or from other factors, such as geography (Los Angeles County is a large urban center while Riverside County is an

exurban area), local labor markets, or unobservable characteristics of the participants (Freedman, et al 2000).

2.7.1.6. The National Job Corps Study

Since 1964, the Job Corps program has been a mainstay of national efforts to promote the self-sufficiency of disadvantaged youths between the ages of 16 and 24 years old, most without a high school diploma. The National Job Corps Study is based on a national random sample of all eligible applicants to Job Corps in late 1994 and 1995 (Mathematica Policy Research 2001). The participant sample included 11,313 youths who completed the 48 month interview, about 80 percent of the original sample of both training program and control group members (Mathematica Policy Research 2001).

At the time of this study (2000), the core services were delivered at 110 Job Corps centers nationwide, through federal agencies, private contractors, private businesses, eight national unions and thirty Civilian Conservation Centers (CCCs) run by the federal government. The Job Corps program is unique compared with other job training programs with respect to the intensive education, training, and support services it provides in a residential setting; about 88 percent of the students live at the training centers while enrolled. About a third of all participants attended large Job Corps training centers with over 500 enrollees. Job Corps has a high degree of federal direction, with many regulations and contractual oversight which provides consistency in program administration and implementation. These features make Job Corps one of the most expensive education and training programs (Mathematica Policy Research 2001). The key findings of the study were that, during the first six months, the earnings of Job Corps participants were less than that of the control group but then, after nine months, steadily

rose to $22 a week more than the control group in 48 months. The earnings increase was the result of a combination of higher hourly wage and more hours worked. Also, after four years, the average amount of public assistance for participants declined by $639 (Mathematica Policy Research 2001).

2.7.1.7. Project QUEST

Project Quest, which began operation in 1993, was organized by two community-based organizations affiliated with the Industrial Area Foundations (Giloth 2004). Quest was developed in San Antonio, Texas and targeted low-income residents. The program has been replicated in Austin and El Paso as well. Project Quest training was a sectoral initiative provided through local community colleges and targets specific industries and occupations. In conjunction with area employers, Project Quest identified specific occupations in demand and then developed customized training to suit their needs (Bartik and Hollenbeck 2000). Project QUEST participants was implemented by local community colleges and its participants are integrated into the student body (Elliot, et al. 2001).

Prior to enrollment, participants were required to have a high school diploma or GED and minimum math and reading scores. Project QUEST offered a long training period, one to two years, with a relatively high program retention and graduation rate (Elliot, et al. 2001). Elliot ascribed the program's low attrition to thorough pre-enrollment screening and good case management. Trainees worked part time to supplement a modest stipend from Project Quest. Quest provided extensive support for trainees both during and post-training (Bartik and Hollenbeck 2000).

Although Project Quest has not been evaluated using random assignment methodology, Bartik and Hollenbeck (2000) state that post-training wages were $4,000 more than before training (1995 dollars). According to Giloth (2004), Project Quest has trained and placed into employment 1,400 at an average hourly wage of $10. A 1996 Massachusetts Institute of Technology study of Project Quest estimated that graduates' hourly wages increased by between 23 percent and 40 percent compared to what they earned on their last job before entering the program. Smith (2002) states that Project QUEST participants also increased the number of hours they worked per week, contributing to an estimated increase in earnings of between $4,923 and $7,457 a year.

2.7.1.8. Aspen Institute Sectoral Employment Program (SEDELP)

The Aspen Institute's Sectoral Employment Development Learning Project (SEDELP), funded by the Ford, Mott, and Annie E. Casey foundations, was launched in 1997 by six organizations in California, New York, Michigan, and Texas (Project Quest) (Rademacher 2003). These organizations targeted low-income adults participating in six industry-specific sectoral training programs which included employers in the garment and needle industries, metalworking, healthcare, precision machining, financial services.

Aspen's SEDELP evaluation, a three-year longitudinal survey from 1998 to 2000, analyzed the labor market outcomes of low-income participants both prior to receiving training, at baseline after training, ninety days, and one and two years following training (Smith 2002). Almost all the adult participants (average age 34) had previous work experience (96 percent, with an average of 12.3 years of labor market experience) and 72 percent held a high school diploma. Most participants were female (65 percent), non-white (92 percent), and over a third (38 percent) were immigrants.

This study did not have an experimental design or a comparison group so it was not possible to directly link changes in participant wages to program participation. The evaluators, Zandniapour and Conway (2003), argued that that pre- and post-training differences in wage income indicated that some effect must have been occurring. Not explained by the evaluators was why a more rigorous statistical analysis was not performed.

Zandniapour and Conway (2003) and Rademacher (2003) reported that SEDELP participants substantially increased their wage earnings. Of the 732 participants surveyed at baseline, only about half (371) were re-surveyed at two years after job training was completed. About a quarter (26 percent) of all respondents after two years reported no income but for those who did, wages increased from $9,036 at baseline to $16,456 one year after training and $19,809 two years after training. Average hourly earnings were $8.63 prior to training, increasing to $10.35 after the first year and $11.32 after the second year, a 31 percent increase over the course of the survey (Zandniapour and Conway 2003). Smith (2002) attributed this increase to participants entering skilled, higher wage jobs.

2.7.2. Do Job Training Programs Work?

2.7.2.1. Reconciliation of Job Training Program Studies

A careful review of the major job training studies, based on the results of the major job training evaluation studies, permits some important generalizations regarding their efficacy to the unemployed today.

- Most studies have found minimal effects from exposure to job training.

The evidence in the literature on the effects of job training on workers wages is mixed. Large-scale studies of major job training programs in urban centers reveal meager results but some studies suggest that, at least under some circumstances, job training can produce positive wage effects. As Smith et al. note (2002), much government-sponsored research—such as the Comprehensive Employment Training Act (CETA), the National Job Training Partnership Act (JTPA) Study, and the Greater Avenues to Independence (GAIN) Evaluations—shows that adult trainees who receive training do no better in the job market than people who do not receive such services (Smith, et al. 2002). Other programs such as CET and NEWWS showed mixed results while the Job Corps, Project QUEST, and the Aspen SEDELP programs did increase earnings, but they did so by screening participants or at a higher cost.

The National JTPA and other studies led program designers to revise the JTPA into the "Work First" WIA program which emphasizes quick re-employment over job training services (Henderson 2004). The lack of positive results, stemming either from statistical insignificance or outright significant negative wage effects, have been deemed as the most important guidance from these studies and has shaped the workforce development policy we have today (Mulhausen 2004). Many of the studies that do find positive wage effects, such as the Aspen SEDELP study, are not methodologically rigorous.

- Some studies have found negative wage effects.

As LaLonde (1995) and other workers have noted, "…evaluators often report that training had no effect or that it actually lowered the earnings of disadvantaged men and youths. This finding that training actually lowered the participants' earnings seems

counterintuitive. It might result from specification errors in the underlying economic model. Or more seriously, it might result from lost labor market experience or from some stigma associated with having participated in government training programs."

In their National JTPA study, Bloom and Orr wrote that, "…one cannot control directly for characteristics that affect labor market outcomes but that cannot be measured fully, such as motivation" and that "although a wide range of statistical matching and modeling procedures have been used to address the problem (of selection bias), no acceptable solution has been found." This statement was made even though their study had the luxury of randomization that ideally should have eliminated the effect of unobserved characteristics. Even randomization has problems such as participant dropout rate and other differences between trained and untrained participants. Goldhaber and other workers in field of educational impacts analysis recognize the existence of unobservable effects but underscore the difficulty of including such factors in analyses (Goldhaber and Brewer, 1996). Educational processes are often treated in the literature as emerging from a "black box", in part, because measurement is so difficult and partly because the choice of variables in a multivariate analysis is arbitrary.

Specification errors such as omitted variables (no "motivation" or insufficient personal data) are a definite possibility to explain negative wage effects. So are effects such as negative employer perceptions of association with job training programs as LaLonde suggests. Or it may be that training programs simply don't work and, in some way that cannot be discerned from the data used for analyses, are actually detrimental. Also, some researchers have suggested that the personal judgments of One-Stop staff can be biased by WIA program incentives so that they select those participants who they

believe most likely to become employed (creaming), not necessarily the ones who might stand to gain the most from training (O'Shea and King 2001).

The primary aim of this current research was to measure the impact of job training on a participant's wage at re-hire. But the decision to hire an employee is not based solely on performance in job training programs but is an assessment based on many personal characteristics. Job training is but one of many factors in a difficult-to-separate bundle of personal characteristics which is judged by each hirer.

Other concerns relating to job training studies include:

- Larger studies with more participants had relatively poorer results. The Job Corps was an exception, at least in part because it was an expensive, residential-based job-training program.
- Statistical significance is a problem with most of the studies.
- Many job training studies focus on improving labor market outcomes for youth, disadvantaged and welfare populations, a consequence of job training having a social, not economic, focus.
- Geographic focus is on job training programs in major urban areas, and do not address many suburban areas, much less rural, areas.
- Most, if not all, job training programs do not meet the minimum number of hours required to have substantial and lasting impact on human capital and earnings.
- Job training program management appears to an important component of success.
- In the great majority of job training studies, skills-based occupational training was not distinguished from other types of training. These evaluations often combined occupational training with "soft skills" or basic office skills training.

- There is little truly relevant research on the question of the wage impacts of job training on structurally unemployed workers, the primary focus of this research.

Based on this summary of the larger and more rigorously evaluated job training programs, the answer to the question, "Do job training programs work?" is a qualified "no." Some studies have found positive impacts on wages from job training but of those with statistically significant results, most programs had small, if any, effects (Raphael 1986). Those that found positive results were either expensive (National Job Corps) or well led (Riverside GAIN) and thus problematic for replication. For the programs with negative impacts on trainee wages, the reasons are often obscure—worker motivation or other personal characteristics such as male gender are often mentioned as causative.

2.7.2.2. The Effectiveness of Job Training Programs

The lack of income impacts for all participants, even for the women who measured a positive impact for education, suggests that the JTPA, and by implication the similar WIA program, can be of limited effectiveness, especially given the program's ambitious publicly-stated goals. The large, systematic studies of job training effectiveness like Orr's (JTPA) and MDRC's Stephen Freedman's evaluation of the Los Angeles Jobs-First GAIN Program (2000) focused on urban training programs and found meager results. Lafer's 2004 study of hundreds of job training programs states, "One point of consensus emerges: almost all varieties of education and training services have resulted in small or insignificant earnings gains… not a single study suggests that job training has enabled impoverished Americans to earn their way out of poverty".

The views of Lafer and Freedman, and other critics of job training, are not universally shared, however. Robert Giloth (2004) and others contend that many large

urban job training programs are not operated efficiently, leaving open the possibility that suburban and rural programs may be more effective. Many studies attest to the efficacy of job training (Aspen Institute 2001, Hollenbeck 2003, 2004) but, unlike the Abt and MDRC studies, very few of the counter-studies examined for this research, if any, included a true experimental design with control and treatment groups. Stated results are often anecdotal, frequently focusing on exemplary participants and program process metrics such as attendance and training program completion rather than outcome metrics such as increased wages or extended attachment to the workforce

The Workforce Alliance has published perhaps the most detailed and cogent rejoinder to critics of job training in the U.S. (2000). Their primary claims—that the successful programs made good use of training but subsequent poor employment experiences made the results seem less significant and that the evaluations did not focus on individual programs and sites which had good results— unfortunately seem consistent with the findings of the critics. A successful job training and education strategy must improve worker earnings and be replicable at many sites, not just selected sites with superior management or other favorable local factors.

Based on the evidence from the literature, it appears that some individuals can increase their income with job training and education but this only works if relatively few are trained (Grubb 1995). This common error is a fallacy of composition in which the results achieved by a few are wrongly thought to be achievable by the many. Perhaps those previously employed in highly skilled-occupations and displaced by outsourcing and offshoring can benefit from training but for the less skilled the benefits are often much more limited. While politically unpopular, some labor market analysts argue that

job creation strategies may be the only feasible means of providing work opportunities for millions of the unemployed. If the failure of the unemployed to find good jobs cannot be adequately explained by recourse to stories about the personal foibles and failures of the jobless, but by institutional factors beyond their control, a new way of thinking about unemployment, or a return to old ways, may be necessary.

CHAPTER 3

RESEARCH METHODOLOGY

AND DATA ANALYSIS

3.1. Study Areas, Analysis Units, and Data Sources

3.1.1. Overview of Methodology

This research investigated which Georgia Department of Labor (GDOL) job training services produced significant positive wage and duration of unemployment impacts on structurally unemployed workers during the 1999-2003 study period. The prime focus of the research was GDOL job training services, ranging from basic job search assistance and employability training to skills-based training, which were examined to assess benefits to participants experiencing a transition from a declining industry to new employment in a different industry.

The methodological approach was to use a quasi-experimental approach to: 1) identify Georgia's structurally declining industries; 2) determine the wage and job search time impacts from job training services; and 3) assess the cost effectiveness of GDOL job training programs. The primary sources of information for this research were the U.S. Bureau of the Census 2000 employment counts by industry from the County Business Patterns (CBP), GDOL individual wage data, GDOL ES-202 firm data, GDOL Unemployment Insurance (UI), GDOL demographic data, and GDOL job training datasets. The GDOL datasets were comprised of microdata compiled by that agency. The methodologies utilized in this dissertation ranged from a shift-share analysis to a regression-controlled effects analysis to a cost-effectiveness analysis to assess program

efficacy to job training service participants. The effects of specific job training services were assessed based on the regression coefficients in the training impact model equations relating the pre- and post-training wage differences and job search time dependent variables to the job training independent variables and the demographic control variables.

Unlike previous work on the impacts of job training services, this investigation focused specifically on unemployment resulting from the restructuring of major industries in Georgia. A unique feature of this research was that three levels of geographic analysis were utilized: state-level, the state's twenty Workforce Investment Areas (WIAs), and the state's 159 counties identified on a nine-level Urban-Rural (UR) continuum. Georgia's counties vary greatly with respect to population, income, and industry structure, so significant variability in job training efficacy was expected.

A three-stage research methodology (Figure 3.1) was utilized:

1) Identification of Georgia's structurally unemployed population.

Shift-share analysis based on U.S. Census County Business Patterns data from 1999 and 2003 was used to identify Georgia's declining industries based on counts of the unemployed identified over that period and the decomposition of those counts into national share, industry mix, and local competitive job loss components. The firms experiencing the largest net job losses due to industry mix factors, an measure of changing industrial organization, were identified as the top structurally declining sectors.

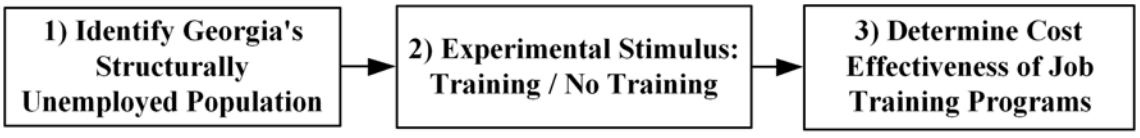

Figure 3.1. Research Design Overview

2) Exposure to stimulus – training vs. no training.

Using the identified top declining sectors via the industry mix shift-share employment changes, coupled with the presence of Unemployment Insurance (UI) claims records, the GDOL data provided the basis for discerning the structurally unemployed (treatment group) from the population of untrained (comparison group) workers. Demographic and job training data were also matched to the wage and industry records.

The research design methodology analyzed these data with Ordinary Least Squares (OLS) regression techniques that statistically compared workers within the structurally unemployed study population receiving a stimulus (job training) to those not receiving the stimulus (the untrained population) and then looked for significant differences in outcomes (wages and duration of employment) attributable to the stimulus. The research methodology recognized potential systematic differences in prospects for wage and duration of unemployment impacts between the treatment groups (by job training service) and the untrained comparison group due to exposure to job services. This approach took advantage of the fact that both the treatment and reference groups had identical personal information: previous wage history, age, race/ethnicity, gender, county of employment (urban/rural, WIA region), and GDOL training/education data.

3) Determine training program effectiveness.

Significant positive differences in mean wages (a dependent variable in the regression analysis) and the time required to regain stable employment (a second dependent variable) between the trained (treatment) and non-trained (comparison) populations were taken as indicative of the efficacy of the State's Workforce Development System (WDS) to structurally unemployed workers. Cost-effectiveness

analyses (CEA) compared job training services with respect to success at alleviating the adverse effects of structural unemployment on Georgia workers leaving declining industries.

3.1.2. The GDOL Datasets and Their Salient Characteristics

Once Georgia's declining industries were identified with the CBP datasets, the goal of the data analyses was to use GDOL datasets to identify individual workers leaving structurally declining industries and then to subsequently analyze the potential wage and job search time effects resulting from worker choice between job training versus no job training. Information from the GDOL wage, ES-202, UI, job training, and demographic databases were combined into a single record format for each wage earner. Each of these constructed individual employment history records, ranging over the full 20-quarter study period from January 1999 to December 2003, contained information from each of these databases. This longitudinal database allows consideration of employment dynamics in conjunction with job training experiences.

Only workers experiencing a definite sectoral transition between periods of stable employment were considered in this analysis so the means by which this was accomplished is important to the research results. Each of the GDOL datasets used in this research has important features and limitations which bear on this design:

1) GDOL Wage Dataset--The GDOL collects information on a worker's quarterly earnings in the Individual Wage file for the purpose of administrating the state's Unemployment Insurance Program (Hotchkiss 2004). Worker wages were linked to the ES-202 firm-level microdata via an Employer Identification Number contained in both datasets. As with the ES-202 files, these microdata are highly confidential with very

limited distribution. The Individual wage file contained no information such as full or part-time status or hours worked.

Many workers had multiple wage records in a single quarter because they had more than one source of wage income (e.g., a second or even third job). If each individual wage income record came from the same industry, then all that wage income from that industry was aggregated and included in the individual employment history record. In the case of wage income from two or more sectors, only the industry from which the largest wage income was derived was selected for inclusion in the individual employment history record. Only wage income was included in this analysis.

2) GDOL Firm-level Unemployment Insurance Dataset--The ES-202 dataset, formerly the Covered Employment and Wage Program now known as the Quarterly Census of Employment and Wages (QCEW), contained data on establishments such as a unique firm identifier number, county of location (FIPS), the number of employees, and total wages paid (payroll) for establishments covered by state UI laws and the Unemployment Compensation for Federal Employees (UCFE) program. ES-202 firm microdata from the GDOL is published at the four-digit SIC level and is collected monthly. The data was made available to this research on a quarterly basis for the entire 1999-2003 study period.

Small firms are under-represented in the ES-202 database because employers report only if they pay employees for 20 or more weeks a year or more than $1,500 in a single quarter (White, et al. 1990). The effect of firm size on job loss can be ambiguous. In large, structurally declining industries a firm can layoff many workers but, in the aggregate, so do small firms. The extent to which effect predominates in this analysis is

unknown. Family businesses and sole proprietorships are also not included in the ES-202 files. Because these businesses are small, their exclusion probably results in only a small underestimation of total employment (White, et al. 1990). ES-202 covers non-farm civilian wage and salary employment only.

3) GDOL Unemployment Insurance (UI) and Demographic Datasets—Unemployed workers have the option of registering with the GDOL for the UI program. Registration under the UI program is a requirement for receipt of UI compensation benefits and job training services. Not all UI registrants receive compensation benefits if their spell of joblessness is sufficiently brief. An individual UI record is generated for each worker, including a unique employee identifier number and quarter of registration under the program. Demographic data from the GDOL included age (birth date), race, and gender information.

4) GDOL Job Training Dataset—Each individual job training data record contained a uniquely matchable participant number and information on participation in a specific program with relevant timing. Many workers receiving GDOL job training had multiple training experiences so it was necessary to combine multiple job training records for an individual into multiple fields in the individual employment history record.

3.2. Research Hypotheses

This research explored several hypotheses relating to the effectiveness of GDOL job training programs on post-training wages and the length of job search of workers experienced when leaving structurally declining industries in Georgia. The primary research question guiding this research was "Which GDOL job training programs are

most effective at alleviating structural unemployment, and why?" Stated as formal research null hypotheses:

> Hypothesis 1: For structurally unemployed workers, GDOL job training programs are not associated with increased wages when re-hired into stable employment, and:
>
> Hypothesis 2: For structurally unemployed workers, GDOL job training programs are not associated with reducing the time required to find new stable work.

Specifically, failing to reject these hypotheses would be indicative of the lack of positive effects of GDOL job training services as reflected by negative or negligible wage effects and increasing the duration of unemployment of trainees versus the untrained. The rationale behind these null hypotheses was that job training was not an effective means of building the human capital of structurally unemployed workers or significantly improving their chances of re-employment at an equal or increased wage.

If these hypotheses were rejected by the objective data on worker employment and wages in Georgia, then the research findings would be consistent with an alternate hypothesis of positive wage and reemployment effects from job training. As this research focused on eight different job training services funded by the GDOL, it was possible that some tracks would be found to be effective and some not.

During the study period 1999 to 2003, Georgia's unemployed workers were a varied population—male and female (52.5 percent female); young and old (mean age 35.3 years, 16 to 86); white and non-white (48.8 percent white); blue-collar and white-collar; skilled and unskilled—each group facing a different hiring environment and each

with its own distinct set of training and educational needs. For this research, structurally unemployed workers in Georgia were assessed via demographically adjusted regression analysis with respect to demographics and GDOL training program exposure as explanatory factors for post-training wage and time-to-reemployment differentials, both direct indicators of program efficacy to workers. These secondary research null hypotheses correspond to these differences:

Hypothesis 3: GDOL job training is less beneficial to female workers than male workers;

Hypothesis 4: GDOL job training is less beneficial to white workers than non-white workers;

Hypothesis 5: GDOL job training is less beneficial to adult workers than younger workers

3.3. Research Methodology

The detailed methodology presented in Figure 3.2 was designed to address the primary and secondary research hypotheses and to answer the central research questions, "Which GDOL job training programs were most effective at alleviating structural unemployment?" The first step was to identify Georgia's structurally declining industries and the unemployed workers leaving them. A shift-share analysis utilizing County Business Patterns was used to identify declining industries in Georgia (3-digit SIC) over the study period 1999-2003 into national, industry, and competitive effects.

For the five-year study period, a quarterly employment and wage history was constructed for each worker in Georgia from which transitions between sectors were

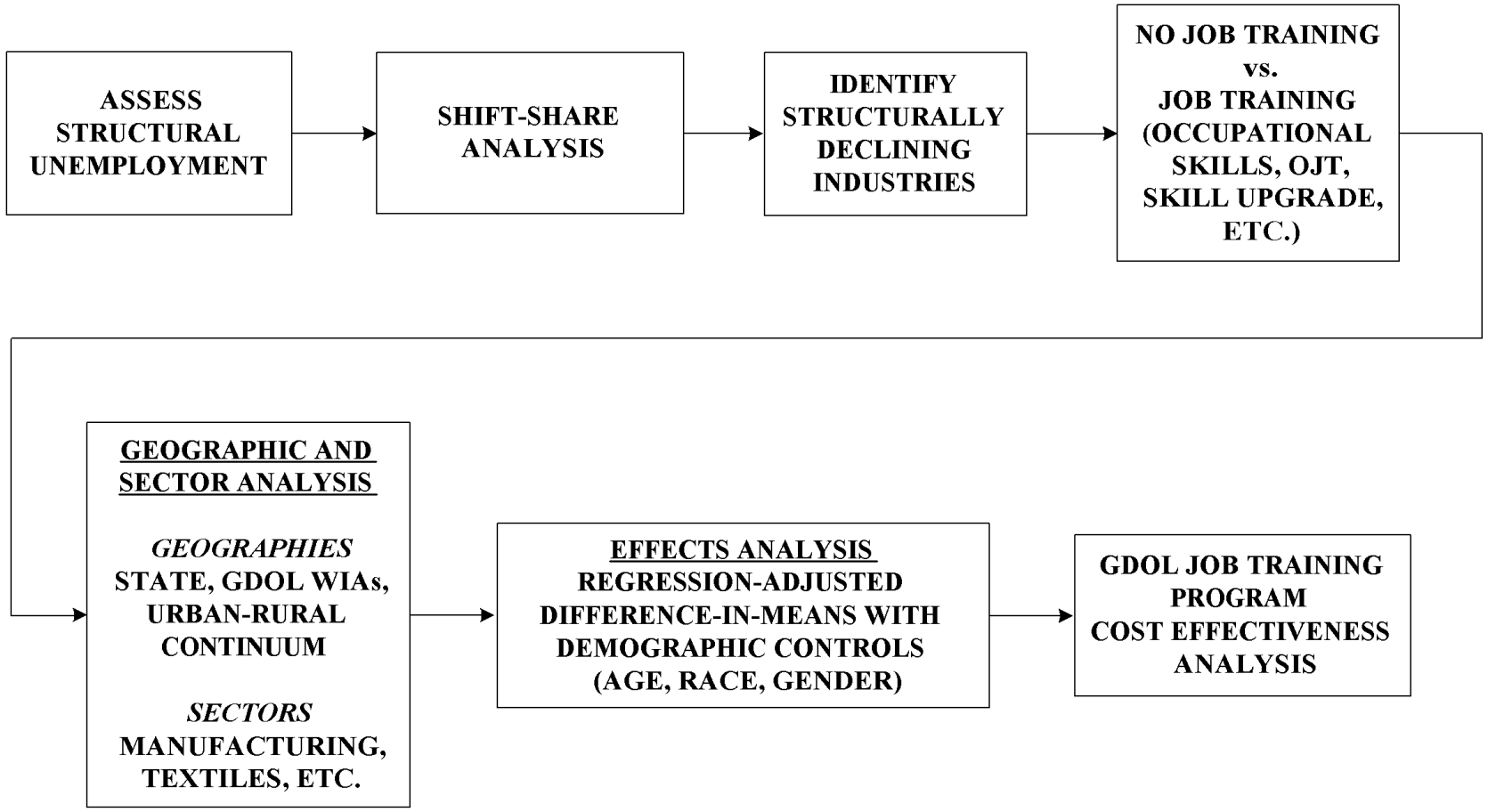

Figure 3.2. Research Design Methodology

determined. GDOL Unemployment Insurance (UI), demographic, and job training data were matched to the employer-employee dataset and used to perform the regression analyses.

For the state and each of the nine Urban-Rural Continuum areas and the twenty GDOL WIAs, the research methodology used demographic-adjusted regression techniques to assess the differential wage and duration of unemployment impacts for workers electing job training after leaving a declining industry to those who did not pursue additional training opportunities. A cost-effectiveness analysis permitted relative comparisons of GDOL job training services according to their success at alleviating the adverse wage and duration of unemployment effects of structural unemployment.

3.3.1. Identification of Georgia's Structurally Declining Industries and Workers

3.3.1.1. Shift-Share Analysis: Identifying Industries Undergoing Major Structural Change

A shift-share analysis was used to identify the major declining industries in Georgia and better understand why they are declining. Shift-share techniques were used to decompose employment growth (or decline) by 3-digit SIC industry in the state as a whole, the UR areas, and the WIAs, into three components: (1) the percentage change in national employment over a specified period, in this case five years; (2) an industry mix effect, which is the change in the proportion of national employment in a specific industry compared to other industries in the nation's economy over five years; and (3) a local competitive effect, which is the difference in the proportion of a local industry as a part of the local economy and the proportion of that industry nationally over a five year period. Depending on the industry and the selected time period, all three components can contribute significantly to the net employment change in local industries. Of particular

interest with respect to identifying structurally declining industries are the job losses due to industry mix and local competitive effects.

Using the U.S. Bureau of the Census 2000 CBP data, employment was aggregated by 3-digit SIC codes for all major industries in the state over the 1999-2003 study period with those experiencing the largest losses in employment identified as structurally declining. The industry mix and local competitive factors potentially reflect structural change in the economy, the former nationally, the latter within the state of Georgia. Each measure can be indicative of shifting industrial structure reflecting different reasons for the structural job loss by industry. The industry mix component reflects national industrial restructuring as relative employment in different industries shifts due to offshoring and improvements in productivity. When competitive factors dominate the shift-share calculation, the cause of the job losses was likely due to local industry decline compared to the nation as a whole.

3.3.1.2. Definition of the Structurally Unemployed Worker Population

A universally acceptable definition of structural unemployment is problematic (Riddell 2000, Killingsworth 1978) so the focus of this research was an operational definition based on workers leaving declining industries as identified with the methodology in the previous section. The operational definition of structural unemployment used in this research required that a worker experience unemployment from a structurally declining industry identified in the shift-share analysis with subsequent re-employment in a different industry (4-digit SIC). This sectoral transition from a structurally declining industry to another industry distinguished the focus population for this research. The research focused on workers with stable employment--

at least two quarters of continuous employment--who lost work and, after a long spell of at least two quarters of joblessness, eventually regained stable employment in a different industry. The important question was, for those opting for GDOL job training services, did they find new jobs which maintained or improved their wage income or reduced the duration of their unemployment compared to those not electing job training?

3.3.1.3. Spells of Unemployment

Workers forced by structural change in the economy to leave declining industries frequently experience spells of unemployment lasting six or more months (see Chapter 2 Literature Review). Figure 3.3 illustrates three scenarios of unemployment common in many Georgia workers' employment histories. The definition of stable employment was important to this research design because the computer algorithms used by this research to construct the worker employment histories and subsequently to detect spells of unemployment had to carefully anticipate these and similar scenarios.

Figure 3.3.A. depicts a long bout of unemployment interrupting a worker's employment in a single Industry A. In this case, although long-term unemployment (six months) was experienced, no transition to a different industry occurred and so would not be considered in this analysis. In Figure 3.3.B., three stable periods of stable employment in three industries A, B, and C were punctuated with two periods of long-term unemployment (LTU) and so would be included in this analysis. If Industries A and C were the same industry, this definition would still find two periods of LTU because each transition was to a different industry than the current industry. Figure 3.3.C. indicates that a worker, after losing stable employment in Industry A, regained work (two months) in Industry B. After losing employment in Industry B, the worker was unable to

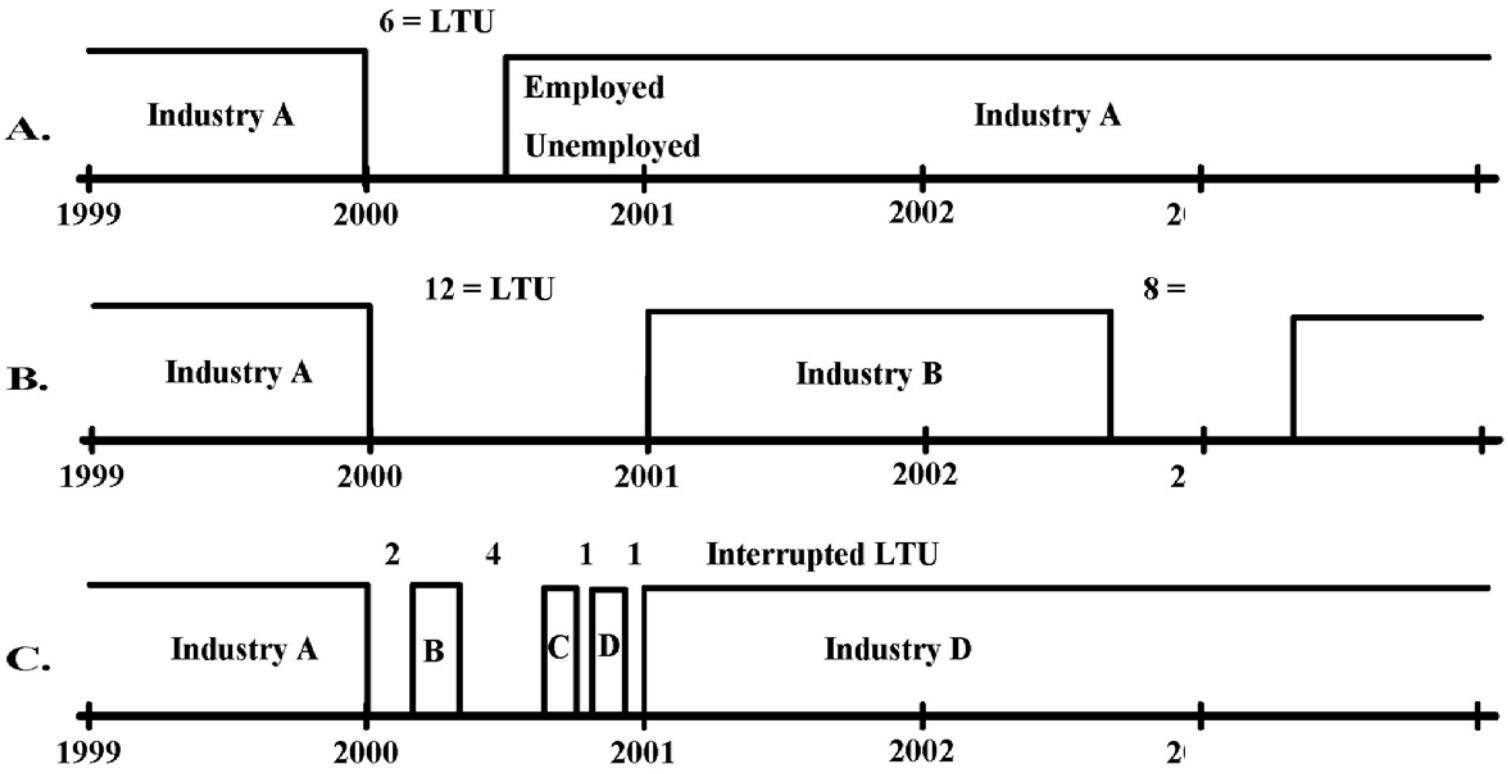

Figure 3.3. Spells of Unemployment

regain stable employment for eighth months. During this period of interrupted long-term unemployment, attachment to the workforce was intermittent with no stability until the second period of employment in Industry D. By the definition used in this research, Scenario C depicts one sectoral transition, from Industry A to Industry D.

3.3.1.4. Construction of Worker Employment Histories

Workers leaving a declining industry do so for many reasons, among them a drop in demand for labor in that industry because of shrinking output, more attractive prospects in another industry, or personal reasons such as retirement, disability or death. Some are quickly re-employed (less than one quarter jobless) but some remain jobless for six months or longer. All workers have the option of electing GDOL job training services. The quickly re-employed worker population may have elected training services even though they had a new job.

The analytical approach to defining structural unemployment was based on the duration of unemployment after leaving a declining industry (Hyclack 1996, Mocan 1999, and Simler 1964). The Georgia Department of Labor (GDOL) Unemployment Insurance system files, including firm (ES-202), individual wage, and claims data, were used to assess the frequency and duration of unemployment for each worker in Georgia during 1999-2003. Administrative records have been widely used by researchers to measure dynamic change in the labor market for both firms and workers (White 1984 and Hyclack 1996). Individual wage records are particularly powerful when matched with other data sources, including detailed industry SIC code, size of firm, worker wages and demographics, and GDOL job training data.

Each GDOL employee wage record included quarterly wage income and an employer identifier that were linked via ES-202 to the firm and industrial sector employing the worker. With this microdata, an employment history by quarter for the 1999-2003 study period was constructed for all workers.

For a worker to be considered as unemployed, an associated UI record indicating at least one quarter of registration had to be identified. A gap in a worker's wage history was not considered an adequate basis for classifying a worker as unemployed. A zero wage (no wage record) was insufficient because of the possibility that a worker could have chosen not to work during a given period. Also, workers receiving UI compensation benefits show a modest quarterly wage income so many unemployed workers show some wage income[6]. Registration with the GDOL for receipt of UI payments was taken as an indication that the period of unemployment was likely involuntary and that attachment to the workforce would be re-established in the future.

Gaps in the wage records, or wage records indicating a wage loss of 80 percent or more, coupled with the presence of UI claims records were taken as indicative of spells of unemployment. Long-term unemployment with eventual return to the workforce is a signature profile of structural unemployment, as distinct from discouraged workers who may never return to the workforce. Structurally unemployed workers leaving declining industries were tracked with the GDOL wage data during the study period if re-employed or tracked with Unemployment Insurance (UI) data if not yet re-employed. Tracking

[6] In second quarter 2001, the formula for calculating a Georgia claimant's weekly benefit amount (WBA) was based on the wages in the two highest quarters in the base period divided by 46. For that quarter, the average Georgia weekly UI benefit was $225.70, equivalent to a quarterly wage of $2,708.40. Source: U.S. Department of Labor. "Unemployment Insurance Data Summary, Second Quarter 2001" Employment and Training Administration (ETA), www.doleta.gov.

discouraged workers was not possible after UI benefits were lost because they were no longer in the GDOL WDS system. Only workers becoming structurally unemployed during the study period were included in this research. For workers regaining stable employment (two quarters of continuous employment in an industry), an assessment of the intervening spell(s) of unemployment and any wage impacts from job training was feasible with the GDOL micro-datasets and was the primary focus of this study[7].

Workers finding re-employment after leaving a declining industry were tracked using the GDOL wage and UI benefits receipt data. If returned to work during the study period, workers were again represented in the GDOL datasets and included in this analysis. Workers from declining industries not returning to stable employment during the study period may be structurally unemployed but were not included in the effects analyses.

Long-term unemployed workers who demonstrably sought work (UI job search requirements) to the point of exhaustion of UI benefits (normally 26 weeks) were considered as structurally unemployed but were not subsequently tracked with GDOL data or tested for training effects unless they returned to the Georgia workforce. Economically rational workers leaving declining industries either got a job or drew UI benefits until re-employed or until benefits were exhausted, thus ensuring inclusion in the GDOL data.

3.3.1.5. Employment Transitions Between Industry Sectors

[7] The longitudinal GDOL micro-datasets have a unique advantage over other employment datasets such as the US Census Public Use Microdata Samples (PUMS) and the Current Population Survey (CPS) neither of which link current to previous employment status, a requirement for tracking workers through extended periods of joblessness.

Accurate identification of worker sectoral transitions between industries was key to identifying structurally unemployed workers. Due to the volatile nature of many workers' employment experiences, it was necessary to filter the individual wage histories so that one or more periods of stable employment could be identified. In the context of this research, a structurally transitioning worker was required to show one stable period in the declining industry followed by a subsequent period of stable employment in a different industry. This job stability requirement was imposed on both the old and new employing industries. The implication of this requirement is that the results are generalizable only to workers with persistent, even if occasionally interrupted, attachment to the Georgia workforce.

Decision rules to measure cross-sector transitions were created and implemented with a clustering algorithm that partitioned each individual employment history record into spells of employment. The analysis did not assume that workers leaving or joining a firm did so exactly on the transition between GDOL quarterly reporting boundaries. Therefore, censoring of the wage data during the quarter in which UI registration was documented was necessary so that partial earnings during a quarter did not bias the wage histories downward (Katz and Meyer 1990). For the case of three or more quarters of employment, the average calculated wage disregarded the first and last quarters of employment. For the case of two successive quarters of employment, the quarter with the highest wage was taken as the average wage.

3.3.1.7. Cross-Sector Employment Transition Diagrams

Figure 3.4 schematically depicts a possible transitional path between sectors for a worker losing a job in Industry A (manufacturing) and finding new employment in the

lower-paying, on average, Industry B (retail) or higher-paying Industry C (information services). Each industry is actually a composite many firms, each of which has an assigned Standard Industrial Code (SIC) or North American Industry Classification System (NAICS) classification based on the principal product produced, and each with its own characteristic average wage and vertical dispersion in wage income levels.

Although some overlap in wage levels exists between Industry A and Industry B, most workers worker experience a drop in income, reflecting Industry B's lower wage structure. The diagram effectively captures the pertinent features of structural unemployment: re-employment in a different industry than the job-losing sector, often at a lower wage. Spells of unemployment do not always result in re-employment in a different industry at a lower wage as the transitions to Industry C illustrate.

Figure 3.4 shows cross-sector employment transitions from the manufacturing industry to both the retail and information sectors. In this example, the retail sector shows a relatively greater dispersion of wage levels than manufacturing while the information sector exhibits less wage dispersion. As depicted, the wage dispersion scale in Figure 3.4 illustrates within-sector wage differentials. The actual dispersion of wage income by industry or firm can be calculated from the ES-202 firm data.

To illustrate the concept, Figure 3.4 shows a top tier (90 percent) wage earner in manufacturing transitioning to retail employment but still in the top wage tier (blue line). The same type of transition is also possible for persons in the low wage tier, such as a custodian (purple line). In both these sector transitions to retail, the worker may maintain a comparable occupation and place in the wage distribution but still lose substantial wage income because retail is a generally a lower-paying industry than manufacturing. More

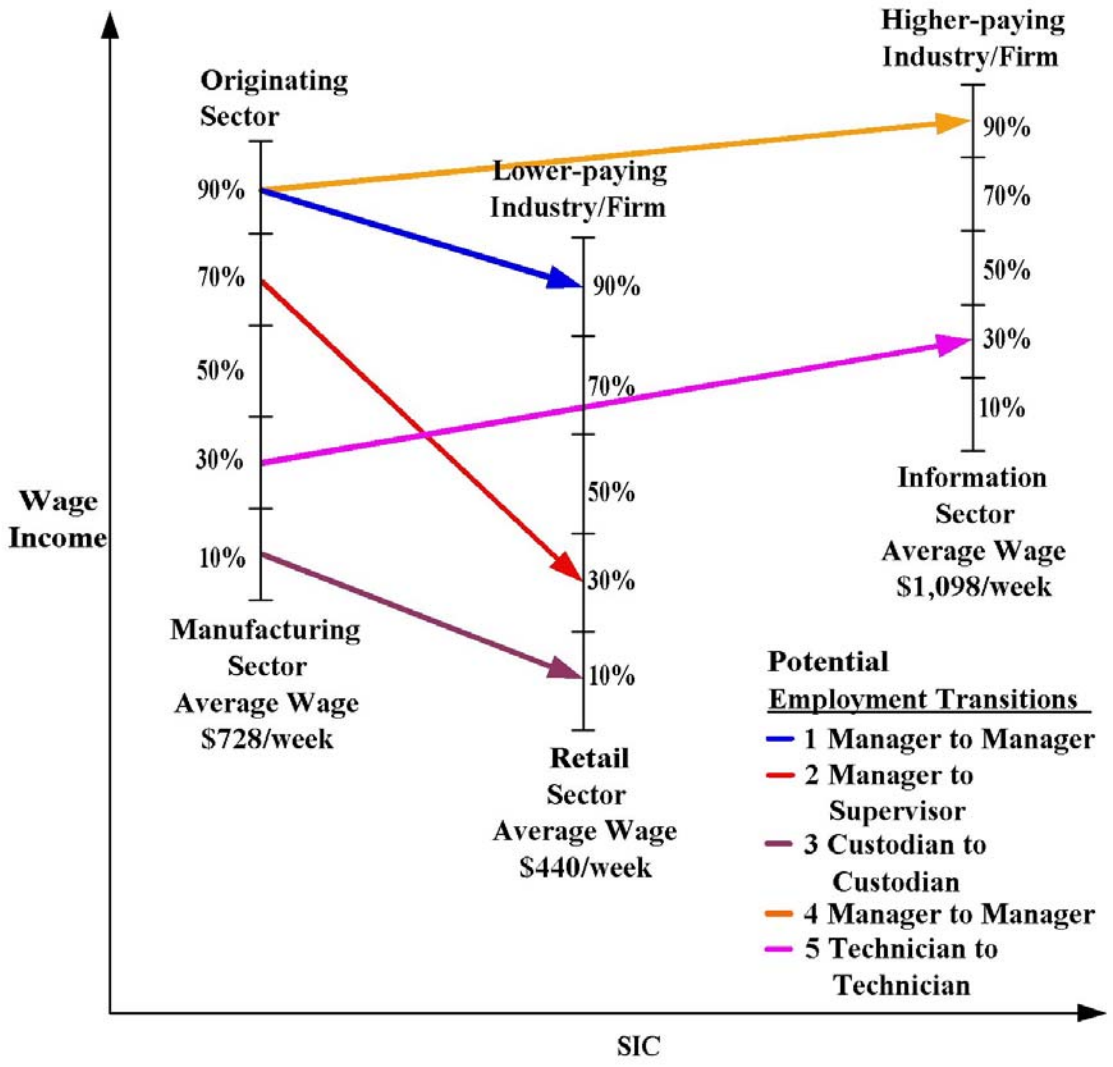

Figure 3.4. Cross-Sector Employment Transition Diagram: Industry/Firm Transitional Wage Levels and Wage Distribution

troublesome is the worker in the 70 percent tier in manufacturing that finds re-employment in retail but in the 30 percent wage tier. It is reasonable to assume that such a large wage cut is seldom voluntary and is indicative of extreme personal hardship and economic pressure to take any job, especially after a long period of joblessness. In this example, all three workers have experienced structural unemployment but the worker falling from the fourth to second wage quintile experienced a substantially greater wage

cut. Such a worker is also more likely to be in need of additional education and job training services to rebound from what could be a temporary situation of low-wage employment. In this example, the transition from Industry A to Industry C shows workers at comparable points in the industry wage dispersions but, because Information Services has a higher average wage, both increased their post-transition wage earnings.

3.3.2. Exposure to Stimulus – Training vs. No Training

The GDOL works with many providers of job training and educational services including the Georgia Department of Training and Education's (DTAE) statewide network of technical colleges, community colleges, and other institutions. Providers and their programs eligible to apply for approval/certification under the WIA program include universities, colleges, community colleges, technical institutes, some proprietary schools, apprenticeship programs, public and private training providers including entities such as vocational-technical schools, community and faith-based organizations, private training companies, labor organizations, employer organizations, and private individuals. Prospective training providers are required to submit applications covering each individual program or course of study proposed for certification. For workers utilizing GDOL Skills Upgrade training services, the state maintained an eligible training provider database including the types and timing of training. Except for Skills Upgrade training, other GDOL job training services were offered internally or by sub-contractors within the network of One-Stop Centers. In this research, once those receiving training or education services through the GDOL were identified, their training experiences were linked by Social Security number to the individual employment history records previously constructed using GDOL wage and ES-202 data.

Some workers leaving declining industries sought GDOL-sponsored job training services and some did not. The wage and employment impacts of job training, controlling for demographic factors, were evaluated via demographic-adjusted regression analysis for each type of job training service and compared to workers who chose no job training. During the study period, many courses of job training were sponsored by the GDOL: occupational skills training, remedial/basic skills, on-the-job training, and skills upgrade training. Technical Certificate Credit (less than one year required), Diploma (1 to 2 years) and Associate degree (2 years) programs are standardized throughout the Georgia's technical colleges to ensure consistent content and instructional methodology. Once the wage and employment effects of the job training service were identified, the question of which GDOL job training programs most effectively reduce the impacts of structural unemployment on workers leaving declining industries was addressed.

3.3.3. Determination of Training Program Effectiveness

Job training programs have been justified for many reasons: to supply better-trained, more productive workers to alleviate shortages of skilled employees in the economy and to reduce unemployment and poverty (Ashenfelter 1977). Each of these benefits implies directly or indirectly that job training programs should raise worker earnings above what they would be if no training had been completed and that they be of net benefit to society with respect to the public investment necessary to pay for the training services. In addition to direct wage impacts once re-hired, job training potentially affects the duration of unemployment, ideally shortening the time a worker must search for a job (McCall 1970, Ashenfelter and Card 1985, The Aspen Institute 2001). GDOL worker microdata was used to estimate wage and job search duration differences between

long-term and structurally unemployed workers receiving training from GDOL programs and those not receiving training. Ideally, compared to untrained workers, trained workers are worth more to firms because they are more productive or have been retrained for the skills employers currently need.

Statistical significance of wage and time variable differentials between the trained and untrained populations does not provide a sufficient basis for ascertaining the most effective means of delivering job training services to Georgia's structurally unemployed workers. Cost-effectiveness analysis (CEA) is a decision tool that considers both the costs and effects of training alternatives, permitting a relative comparison among different training programs for pursuing such goals as improved wages lessened time spent in job search (Levin and McEwan 2000). For this research, CE analysis was the means by which the central research question--"Which Georgia DOL training programs are most effective at alleviating structural unemployment, and why?"—was answered.

The premise of cost-effectiveness analysis is that a specific benefit (raised wages, quicker re-employment) is desired, and that there are several alternative ways to achieve these benefits; the various GDOL job training services. Cost-effectiveness analyses are comparative and address whether the unit cost is greater for one program or another compared to the benefits (White, 1988).

The costs and benefits of job training services accrue to different groups of people, i.e. most costs are borne by the taxpayers while most benefits go to the participant. Table 3.1 views the benefits and costs from the perspective of three groups: the participants, society other than the participants, and society as a whole including

Table 3.1. Potential Benefits and Costs of Job Training

	Trainees	Rest of Society	Society
Earnings gain	+	**0**	+
Fringe benefits	+	**0**	+
Increased taxes on earnings	-	+	**0**
Incremental training cost	+, -	-	-
Increased work-related expenses	-	**0**	-
Reduced leisure time and other personal costs	-	**0**	-
Reduced criminal activity	+	+	+
Psychological benefits of increased employment	+	+	+

participants. In the table, a positive benefit is denoted by a "+" and a cost by a "-" (after Orr 1995).

Ideally, job training programs deliver valuable skills to workers who will use their new skills to improve their position in the labor market. For trainees, the primary program effect is positive earnings changes (or reduced time spent in job search) resulting from more work hours or improved hourly wages. Secondary benefits potentially include reduced criminal activity, the psychological benefits of better work, and fringe benefits such as health care and paid vacation time, if any. Trainees must pay taxes on their earnings and may experience lost leisure time and work-related expenses. The effect of training costs is ambiguous to participants because GDOL services may displace other training that may have been at the participant's expense but this may be offset because the availability of training may lead to increased personal costs.

Irrespective of the cost to trainees, the rest of society must pay for the job training services but experiences offsetting benefits from increased taxes on earnings, reduced criminal activity, and improved social well-being. The rest of society neither directly

benefits or disbenefits from increased worker earnings or fringe benefits, loss of leisure time, or increased trainee work-related expenses.

For society as a whole, the benefits of increased taxes result in no net improvement in well-being (loss to workers offsets gain to society) but positive net gains result from increased earnings and fringe benefits, reduced crime, and a better-functioning society. The training cost to the rest of society (other than the trainee) is negative so the net benefit to both the trainee and society at large is likely negative.

Worker earnings gains and the cost of training are identifiable within the context of this research. However, due to a lack of data and the difficulty of a monetary valuation, fringe benefits, taxes paid, work-related expenses, reduced leisure time and criminal activity, and improvement in social well-being, are not included in this analysis.

Costs and training benefits by job training program were calculated for the short-term (2003, the end of the study period) and for a five-year interval afterward and compared to establish comparative GDOL job training service effectiveness. There is a strong contrast between the typical job training benefits--which decay over 4 or 5 years--and the age-earnings profiles associated with different levels of education, where the benefits of education expand over time (Grubb 1995). Equation 3.2 was used to assess the discounted wage gains and training costs resulting from GDOL job training services (Levy 1995). To calculate present value (PV) of a future stream of wage income over n periods, the following general formula was used:

$$PV = \sum_{t=0}^{n} O_t / (1+r)^t \qquad (3.2)$$

where O is the outcome occurring at time *t,* and *r* is a discount rate between 0 and 1. The annual discount rate adjusted future benefits to account for wage inflation and the declining contribution of job training to income over time.

Cost-effectiveness analysis allows relative comparisons of training programs according to their effectiveness and costs in accomplishing a particular objective (e.g., raising wages at re-employment). By combining information on costs and effectiveness, the calculated CE ratio (CER), Equation 3.3, reflects a relative measure of which program provides a given level of effectiveness at the lowest cost or, conversely, which program provides the highest level of effectiveness for a given cost (American College of Physicians 2000).

$$\text{Cost Effectiveness Ratio} = \frac{\text{Cost training program \#1}}{\text{Effect training program \#1}} \qquad (3.3)$$

3.4. Regression Analysis Models

3.4.1. The Dependent, Control, and Job Training, and Interaction Variables

3.4.1.1. Dependent Variables

Table 3.2 summarizes the dependent, control, and independent variables used in this research to address the research hypotheses. The wage dependent variable (WAGE DIFFERENCE) was based on the difference in average quarterly wages before leaving the declining industry and the average quarterly wages after re-employment. After controlling for other factors, the impacts of job training on wages should be evident in the

Table 3.2. Dependent, Control, and Job Training Variables

Variable Name	Variable Type
Dependent Variables	
Wage Difference	**Continuous**
Job Search Time	**Continuous**
Control Variables	
Age	**Continuous**
Female	**Dichotomous**
White	**Dichotomous**
Job Training Program Variables	
Core	**Dichotomous**
Intensive	**Dichotomous**
Occupational Skills	**Dichotomous**
Remedial/Basic Skills	**Dichotomous**
On-the-Job Training	**Dichotomous**
Mentoring	**Dichotomous**
Extended Job Search	**Dichotomous**
Skills Upgrade	**Dichotomous**

wage differentials as measured by the impact coefficients on the training variables in the regression model. For the continuous wage data, the regression model used Ordinary Least Squares (OLS) techniques. Compared to non-trained workers, job-trained workers would ideally find new employment more quickly, even though job training requires a time investment, because their new skills should be in higher demand by employers than old skills from the declining industry.

3.4.1.2. Control and Job Training Service Independent Variables

The demographic control variables available from the GDOL datasets were age, gender, and race (Table 3.2). AGE was a continuous variable ranging 16 years of age, the minimum age of work in non-family forms and the youngest age a worker can

register with the GDOL, to over eighty years of age, though few such elderly workers appear in the datasets. FEMALE and WHITE were dichotomous dummy variables.

The eight dichotomous job training variables refer to specific services available from the GDOL either internally in their One-Stop Shops or through their service provider networks. As discussed in the Literature Review, WIA services at one level of the three-tiered hierarchy are a prerequisite for training at successive levels (U.S. Department of Labor, Employment and Training Administration, 2000). Skills Upgrade and the other job services can be made available to unemployed adults who have received Core and at least one Intensive service and have been determined to be unable to obtain or retain employment subsequently.

WIA-based training programs fall into three general categories: Core services (walk-in initial assessment and job search), Intensive services (development of individual employment plan) and, finally, Skills Upgrade services which actually provide occupational training in specific trade areas such as electrical or carpentry. Training services lead to a certificate, an associate degree, baccalaureate degree, and provide the skills directly linked to occupations in demand in the local area. Training services must be necessary for specific jobs, or occupations, as recognized by employers and determined prior to training. Most trainees do not advance beyond the Core and Intensive service levels to skills-based job training.

Table 3.3 summarizes the GDOL job training services reflecting the three-tier structure dictated by the WIA legislation. The requirements for the Core and Intensive Services are fully described in the WIA legislation but the remaining categories gives discretion to the states and each Workforce Investment Area to decide the composition of

Table 3.3. Description of Job Training Services Independent Variables

Job Training Service	Delivery	Description
Core	In-house, walk-in	Establish eligibility for programs of financial aid for training and education programs. Initial assessment a brief, preliminary information gathering process based on an individual's basic literacy and occupational skill levels. Follow-up services available for a minimum of 12 months after employment begins and can include additional career planning and counseling; contact with the participant's employer, including assistance with work-related problems, information about additional educational opportunities, and referral to supportive services.
Intensive	In-house, walk-in	Development of a person's Individual Employment Plan (IEP), out-of-area job search expenses, relocation expenses in some cases, internships, referrals to community services and, if judged appropriate, referrals to training.
Occupational Skills Training	In-house or off-site by service providers	Basic instruction in office skills such as word processing and computer familiarization including printers, fax machines, and telecommunications equipment. Contains a "life-skills" component for easing the transition to an office environment.
Remedial/Basic Skills Training	In-house or off-site by service providers	Remedial and basic skills instruction consists of basic literacy and numerical skills. Most often associated with youth training, adults may also qualify.
On-the-Job Training	Off-site by employers	On-the-Job Training (OJT) consists of skills training necessary to perform specific tasks at an employer's site. WIA does not strictly limit OJT to six months as previous programs had done but is limited in duration as appropriate for the occupation for which workers are being trained. Worker wage may be supplmented by WIA funds.
Mentoring	Off-site by employers and social service organizations	Mentoring is utilized in a few WIAs to provide a limited number of participants with one-on-one counseling with job-related and family issues. The WIA legislation provides for mentoring services for a period of at least a year
Extended Job Search	In-house, walk-in	Extended job search is available for participants unable to secure employment within the 8-12 week period of Core and Intensive services. The period of extended support can be 12-24 months in duration. Additional services include assisted job search for areas outside the state of Georgia. Some financial support is provided to participants seeking work in non-local areas.
Skills Upgrade Training	Off-site by service providers	Skills Upgrade training provides occupational skills training to previously untrained workers, persons new to the workforce, or augments a participant's existing skills gained either from previous employment or job training experiences. The programs include tracks such as Electrical Technician, Air Conditioning Service Maintenance Technician, Computer Hardware Specialist, Computer Technician, Engine Performance Technician, HVAC Technician, and Refrigeration Technician. Training requires 12-24 months.

the services offered. Accordingly, the lack of a concise description for the services offered under the remaining categories afford each WIA the flexibility needed to fit each participant's need to the available services[8]. Several job training services including Mentoring, OJT, and Extended Job Search are not offered at all Georgia WIAs.

3.4.1.3. Interaction Variables

Among Georgians leaving declining industries, it is likely that the success of job training in alleviating the impacts of structural unemployment depends critically on age, gender, and racial factors. For example, as mentioned in the literature review, in many circumstances job training has often been found more beneficial to females than males. Table 3.4 presents several secondary research hypotheses along with the interaction terms for inclusion in the regression that will permit their testing. "Beneficial" is measured in terms of impacts on the two dependent variables.

Table 3.4. Secondary Research Hypotheses and Interaction Terms for Testing

Hypothesis	Interaction Terms to Test Hypothesis	
Job training is less beneficial to female workers than male workers	Gender * Training Gender * Core Gender * Intensive Gender * Occupational Gender * Remedial	Gender * OJT Gender * Mentoring Gender * Extended Search Gender * Skills Upgrade
Job training is less beneficial to white workers than non-white workers	White Race * Training White Race * Core White Race * Intensive White Race * Occupational White Race * Remedial	White Race * OJT White Race * Mentoring White Race * Extended Search White Race * Skills Upgrade
Job training is less beneficial to adult workers than younger workers	Age * Training Age * Core Age * Intensive Age * Occupational Age * Remedial	Age * OJT Age * Mentoring Age * Extended Search Age * Skills Upgrade

[8] Interview with Mark Hannon White of the Atlanta Regional WIA, November 10, 2008.

3.4.2. Regression Models

The dependent variables used to assess the impacts of job training services were wage level differences upon re-employment and the duration of unemployment contingent upon the control and job training variables. It was recognized that other factors affect GDOL job training effectiveness but from a worker's point of view, prompt re-employment at a comparable wage is an important measure of the efficacy of job training services. The wage and re-employment histories of workers completing job training programs were statistically compared to workers not receiving training. The research methodology controlled for systematic variations between the treatment (training after job loss) and non-treatment (no training after job loss) groups by estimating the regression-adjusted differences in the means of the wage and time for re-employment variables. Both the trained and non-trained groups had employment and demographic and training data. Based on these controls, differences in outcomes for program participants to those of comparison group members were attributed to the program(s) of instruction.

Following Hollenbeck (2003) and Barnow (1987), the net program impact PI (Equation 3.4) on the i^{th} structurally unemployed worker receiving job services from the j^{th} program was estimated with conditional difference in means:

$$\mathbf{PI = E(TrainEffect_i|X_i;\ i=training) - E(NoTrainEffect_j|X_j;\ j=no\ training)} \qquad \mathbf{(3.4)}$$

Econometrically, this conditional dependence was parametrically estimated through a general linear regression (Equation 3.5):

$$\mathbf{EFFECT = \alpha + \beta X + \gamma TRAIN + \eta GEO + e} \quad \mathbf{(3.5)}$$

where:

EFFECT	=	TrainEffect if in trained worker population and NoTrainEffect if in untrained worker population;
X	=	vector of individual characteristics including age, gender, and race;
β	=	individual characteristic impact coefficients;
TRAIN	=	vector of job training program dummy variables; 1 for workers receiving job training; 0 for workers not receiving job training;
γ	=	net impacts of job training;
GEO	=	vector of geographic dummy variables;
η	=	net impact of geography;
e	=	error term.

The dependent variable EFFECT was either wage differences pre- and post-transition or duration of unemployment between periods of stable employment from the GDOL employment histories. The control vector X contained demographic and employment data unique to each worker: individual worker characteristics including age, gender, and race. TRAIN was a vector of job training service dummy variables, each representing specific types of job training services. The parameter estimate γ was the net program impact of participation in a particular type of job training service. GEO was a vector of geographic dummy variables, each representing one of Georgia's twenty Workforce Investment Areas (WIAs) or one of nine areas on the Urban-Rural (UR)

Continuum from the U.S. Department of Agriculture or, in the case of the state as a whole, the variable GEO does not appear. The parameter estimate η is the net impact of participation in a GDOL job training service in a specific geography.

A statistically significant difference between the training and non-training populations in terms of mean wages before and after transition to new stable employment, or the time to find new employment, was taken as indicative of the usefulness of the GDOL's job training to long-term and structurally unemployed workers. The job training service dummy variables (sign and magnitude of significant impact coefficient) estimated the impacts of job training services on post-training wages or the reduction in the time to regain stable work for the structurally unemployed.

When all relevant variables are observed, the error term and the unobservable factors are not correlated with the treatment, here job training. When unobservable factors influence the results, regression analysis can be challenging. With a true experimental research design, randomization guarantees that the observable and the unobservable factors that affect outcomes are unrelated to treatment. When randomization is not possible as with this non-experimental research design, alternate means must be found to generate unbiased results. In a regression, the unobservable variables are unmeasured or even immeasurable and are implicitly included in the error term. Thus, the error term may be correlated with the treatment variable, violating one of the assumptions of OLS regression analysis: the unbiasedness of estimators (Wooldridge 1999).

For a simple difference in means calculation to be valid, either enrollment into job training services would have to be totally random or the outcome would have to be

independent of characteristics that are systematically different between the treatment and comparison group, an unrealistic assumption in this case. One basic assumption underlying longitudinal methods is that many differences between training participants and non-participants are constant over time. If they are constant they can be differenced given two or more periods of data. This type of estimator is the "difference-in-differences" estimator. With a difference-in-differences comparison of means estimator, before and after changes in outcomes for participants are compared to before and after changes for non-participants. Two periods of data, one before and one after the period in which individuals decide whether or not to participate, is sufficient to produce a valid estimate.

Because the rich GDOL wage datasets contained wage data both before and after program participation, it was possible to use a difference-in-differences approach as the method for estimating the net program impact. This method effectively allows the use of preprogram levels of wages to control for the net impact effect of receiving GDOL job training services. To control for systematic differences between groups, the method used in this research was to regression-adjust the difference-in-differences; both the pre- and post- training wages for both the treatment and control groups. In other words, the net training impact estimator became the difference-in-differences in conditional means (Hollenbeck 2003, Hollenbeck 2004).

It was recognized that all factors cannot be controlled with these variables, among them: systematic variations in the quality of GDOL-sponsored training despite the federally-mandated uniform program requirements, relative under-funding of specific job training programs in some areas, personal factors not accounted for in the GDOL

demographic data, and other factors. Results are qualified to the extent that, as with any regression analysis, some of the potentially influential variables remain unknown. The influence of these unquantified factors is considered acceptable compared to the direct effects of job training on wage income and the duration of unemployment.

3.4.2.1. Statewide Regression Analysis Model

These general variables can be operationalized for statewide, WIA, and UR geographies in terms of specific variables for worker characteristics and training services (Equation 3.6):

$$\begin{aligned} \mathbf{EFFECT_{ij}} = \alpha + \beta_A \mathbf{AGE_{ij}} + \beta_G \mathbf{FEMALE_{ij}} + \beta_R \mathbf{WHITE_{ij}} \\ + \gamma_C \mathbf{Core_{ij}} + \gamma_I \mathbf{Intensive_{ij}} + \gamma_O \mathbf{OccupSkills_{ij}} \\ + \gamma_R \mathbf{Remedial_{ij}} + \gamma_O \mathbf{OJT_{ij}} + \gamma_M \mathbf{Mentor_{ij}} \\ + \gamma_J \mathbf{JobSearch_{ij}} + \gamma_S \mathbf{SkillsUpgrade_{ij}} \\ + \mathbf{Interaction\ Variables} + \mathbf{e}; \end{aligned} \qquad (3.6)$$

where:

EFFECT	=	dependent variables to be modeled are wage and job search time;
AGE	=	age variable;
FEMALE	=	gender variable;
WHITE	=	race variable;
Core	=	Core Services dummy variable; 1 for workers receiving Core Services; 0 for workers not receiving Core Services;
Intensive	=	Intensive Services dummy variable;
OccupSkills	=	Occupational skills training services dummy variable;

Remedial	=	Remedial educational services dummy variable;
OJT	=	On-the-job training services dummy variable;
Mentor	=	Mentoring services dummy variable;
JobSearch	=	Extended Job Search services dummy variable;
SkillsUpgrade	=	Skills Upgrade training services dummy variable;
γ	=	net impacts of job training;
e	=	error term including unobservables.

3.4.2.2. Workforce Investment Area (WIA) and Urban-Rural (UR) Continuum Regression Model

Long-term and structural unemployment are not geographically uniform phenomena. Geography can play an important role in this job training program impact analysis because the size and diversity of labor markets constrain worker behavior and the fact that workforce development programs are implemented across many regional and local jurisdictions. Important differences in unemployment can arise from the diverse populations between urban and rural areas, suburbs and the central city, and growing and declining areas. Additionally, plant closings and large-scale layoffs in certain areas can sharply escalate local unemployment rates. Considering previous research findings, it was expected that geography would emerge from this analysis as an important explanatory factor behind differences in the effectiveness of the GDOL job training programs. To explore this possibility this research utilized two geographies in addition to the statewide analysis. Equation 3 was modified to allow analysis for specific sub-state geographic areas (Equation 3.7):

$$\mathbf{EFFECT_{ij}} = \alpha + \beta_A \mathbf{AGE_{ij}} + \beta_G \mathbf{FEMALE_{ij}} + \beta_R \mathbf{WHITE_{ij}} \quad (3.7)$$
$$+ \gamma_C \mathbf{Core_{ij}} + \gamma_I \mathbf{Intensive_{ij}} + \gamma_O \mathbf{OccupSkills_{ij}}$$
$$+ \gamma_R \mathbf{Remedial_{ij}} + \gamma_O \mathbf{OJT_{ij}} + \gamma_M \mathbf{Mentor_{ij}}$$
$$+ \gamma_J \mathbf{JobSearch_{ij}} + \gamma_S \mathbf{SkillsUpgrade_{ij}}$$
$$+ \eta_2 \mathbf{GEO_{2ij}} + \eta_3 \mathbf{GEO_{3ij}} + \ldots + \eta_{20} \mathbf{GEO_{20ij}}$$
$$+ \mathbf{e_{ij}};$$

where:

GEO = vector of geographic dummy variables; and

η = net impact of geography.

This regression model was run separately for the nine UR areas and the twenty WIAs using one area as a reference in each case. In this way, differences in job training services across these geographies were ascertained.

The U.S. Department of Agriculture Rural-Urban Continuum Codes (see Figure 3.5) form a classification scheme that distinguishes metropolitan counties by population size from non-metropolitan counties by degree of urbanization and adjacency to a metro area or areas. These two categories have been subdivided into metropolitan (3) and non-metropolitan (6) groupings, resulting in a nine-part county classification system.

In compliance with U.S. Workforce Investment Act (WIA), the state of Georgia has established 20 WIA service areas in Georgia (Figure 3.6). Each workforce area has at least one full-service One-Stop Center from which a range of workforce services, including job training, are made available to job seekers and employers. Georgia's WIAs are a diverse group of economic regions ranging from the county-size urbanized WIAs of

Atlanta and Macon to the expansive rural WIAs which, in the case of the Heart of Georgia, can be comprised of as many as seventeen counties. The GDOL not only serves as a conduit of federal funds to the DTAE and other education service providers but also enforces the uniform quality-of-service requirements that flow down from the USDOL to state and local agencies and their contractors. It is recognized that even with uniform program requirements, important differences in job training program function and effectiveness may exist due to administrative and other local factors beyond the scope of this research.

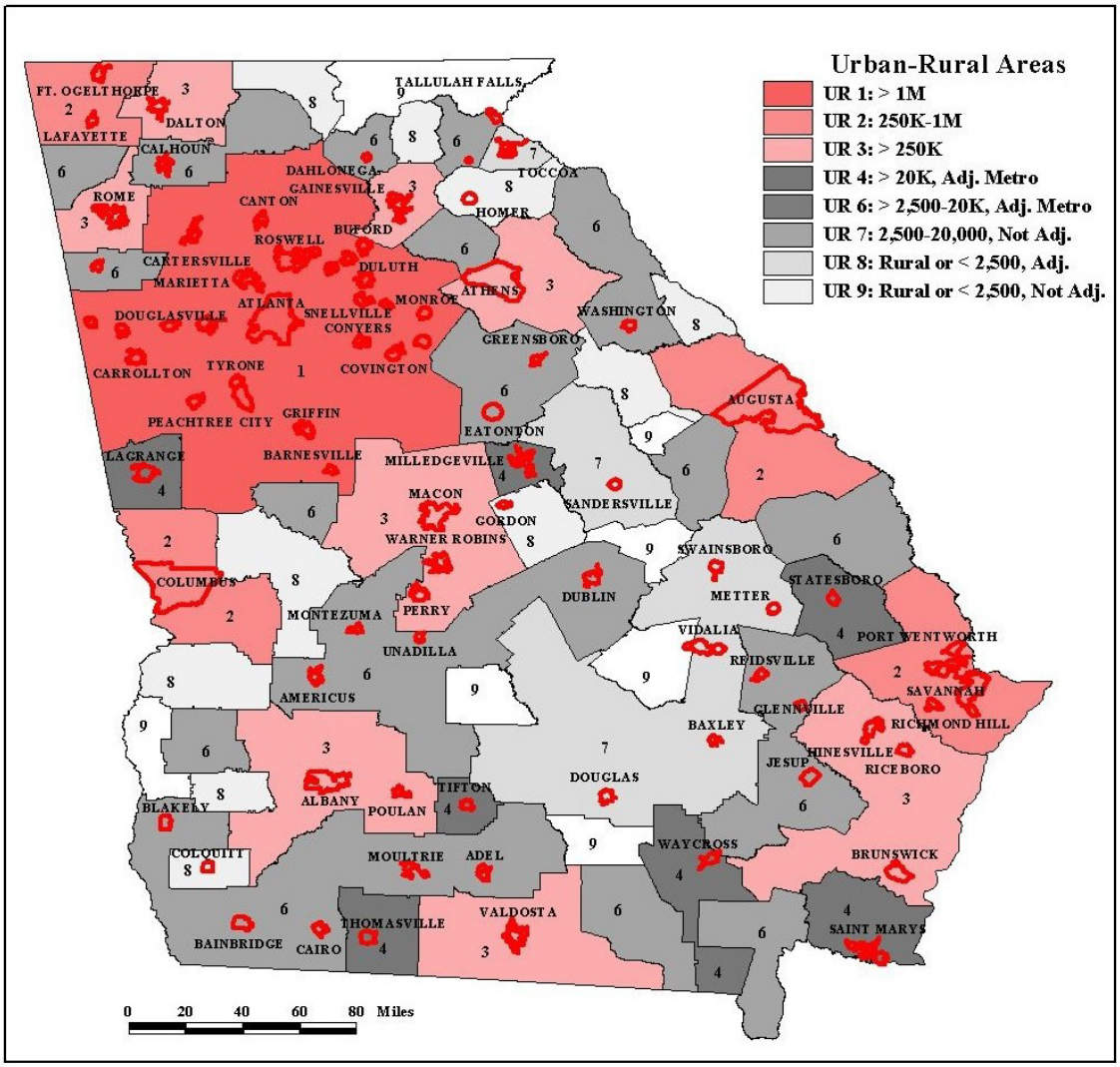

Figure 3.5. Urban-Rural Continuum Areas and Urban Centers

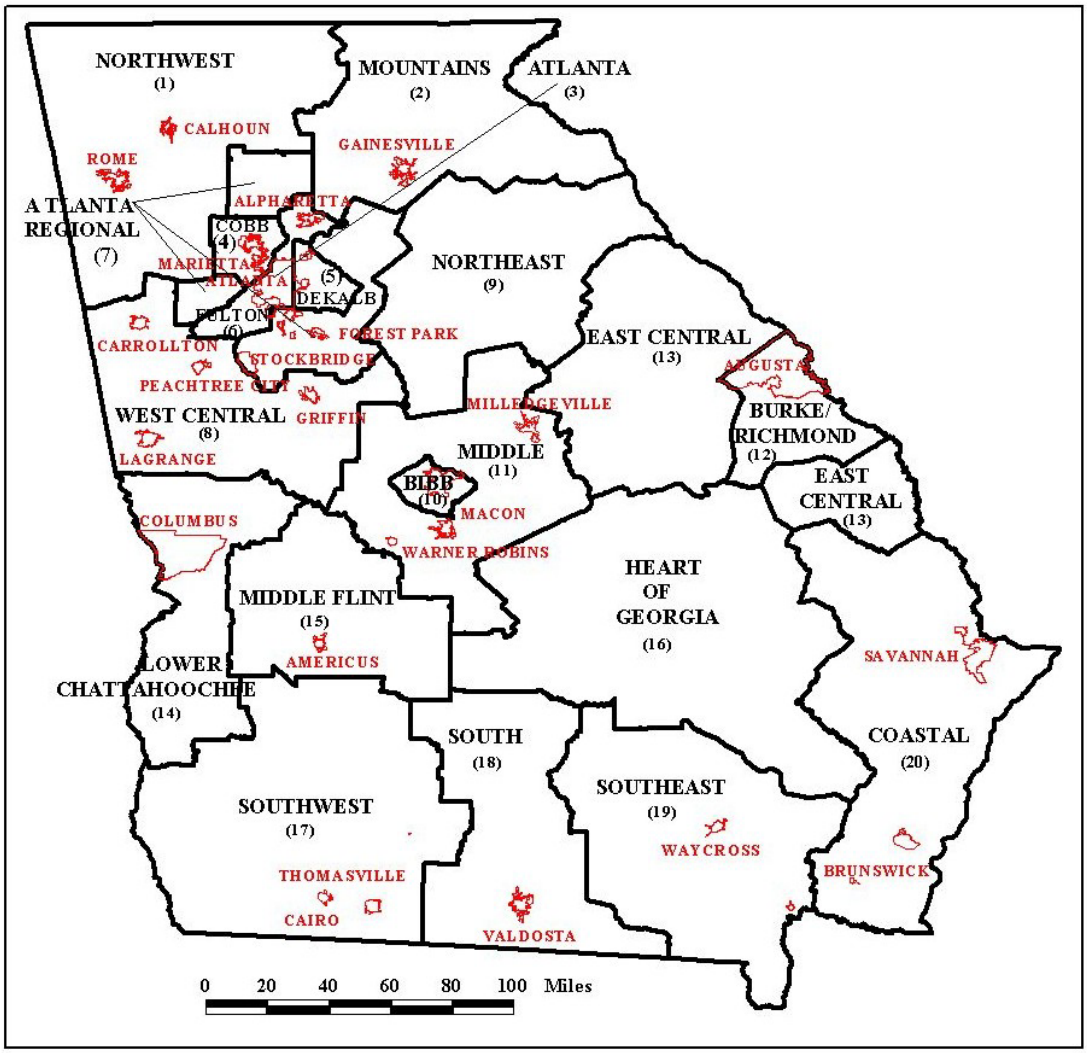

Figure 3.6. GDOL Workforce Investment Areas (WIAs) and Urban Centers (WIA codes in parentheses)

CHAPTER 4

ANALYSIS AND FINDINGS

4.1. Identification of Georgia's Declining Industries

Structurally unemployed workers come from declining industries with little promise of regaining their former significance in Georgia's economy. These workers must find new employment, remain unemployed, or leave the workforce entirely. Some workers will elect job training, either to improve their wages once re-employed or just to regain employment after a protracted job search.

The initial task of this research was to identify the state's structurally declining industries, a prime source of the Georgia Department of Labor (GDOL) job training population. The results of shift-share employment analyses, performed at the statewide, Workforce Investment Area (WIA), and the Urban-Rural (UR) continuum levels were used to identify Georgia's most significant declining industries, the basis for subsequently identifying structurally unemployed workers and subsequently assessing the impacts of GDOL job training services on these workers.

During the 1999-2003 study period, Georgia's economy grew at an anemic pace, an annualized 1.3 percent, partially the result of a shallow national recession characterized by large layoffs and a "jobless" recovery[9]. As discussed in the Literature Review, the decline of the manufacturing sector in Georgia, and the nation generally, has been a persistent trend for decades but it is recognized that a different definition of the study period would yield a different count of workers leaving these and other industries.

[9] Source: The National Bureau of Economic Research (NBER), http://www.nber.org/cycles/november2001/recessions.pdf accessed June 28, 2007.

However, it is during periods of substantial employment decline, such as during the study period, that job training programs are most crucial to the success of individual workers and the economy broadly.

4.1.1. Georgia Shift-Share Employment Changes

4.1.1.1. State-level Shift-Share Employment Changes

The purpose of the statewide shift-share analyses was to identify the specific industries which experienced the most job loss over the 1999-2003 research study period and to better understand the underlying structural reasons for this declining employment. These declining industries were the focus of subsequent job training service impact analyses. The shift-share analyses began with an assessment of net employment gains or losses at the state-level over the study period. From there, shift-share techniques allowed the decomposition of net employment changes into three components, each providing a partial explanation for the industry-specific employment changes. U.S. Census Bureau County Business Patterns[10] (CBP) data were used as the basis for the shift-share analysis to calculate employment changes by industry for the state of Georgia.

Table 4.1 presents the results of the shift-share analysis for Georgia at the 2-digit North American Industry Classification System (NAICS) level. Shift-share methodology decomposes industry mix job losses into National Share (NS), Industry Mix Share (IM),

[10] The County Business Patterns program of the U.S. Census Bureau has been tabulated on a (North American Industry Classification System (NAICS) basis since 1998. County Business Patterns (CBP) data are extracted from the Business Register, the Census Bureau's file of all known single and multi-establishment companies. Data were excluded for self-employed persons, employees of private households, railroad employees, agricultural production workers, and for most government employees (except for those working in wholesale liquor establishments, retail liquor stores, Federally-chartered savings institutions, Federally-chartered credit unions, and hospitals). (Source: U.S. Census Bureau, 2000.)

Table 4.1. Georgia Shift-Share Employment Changes, 1999-2003, All 2-Digit NAICS Sectors

Description	NAICS	NS	IM	LF	EMP. CHNG.
Agriculture & Forestry	11	153	-534	666	285
Mining	21	69	-82	-16	-30
Utilities	22	47	-21	-187	-162
Construction	23	4,600	883	-1,538	3,947
Manufacturing	31	12,771	-92,415	63	-79,595
Wholesale Trade	42	4,777	-8,328	3,679	121
Retail Trade	44	10,730	1,184	-3,418	8,496
Transportation & Warehousing	48	3,009	12,055	-324	14,746
Information	51	2,742	9,994	7,260	19,993
Finance & Insurance	52	3,916	9,536	751	14,197
Real Estate	53	1,310	3,614	-13	4,915
Prof., Scien., and Tech. Svcs.	54	4,482	21,547	-18,269	7,766
Mgmt. of Companies	55	2,311	789	-3,733	-637
Administration & Support	56	7,415	-2,142	-27,315	-22,047
Educational Services	61	1,300	6,257	-1,773	5,782
Health Care	62	8,144	30,687	8,751	47,579
Arts & Entertainment	71	781	3,014	-1,146	2,652
Accommodation and Food Svcs.	72	6,864	16,606	5,804	29,284
Other Services	81	3,457	2,495	-1,988	3,975

Source: County Business Patterns, 1999 and 2003, U.S. Census Bureau

and Local Factors (LF). A 2-digit sectoral analysis is too coarse-grained to provide a detailed understanding of changes in employment but is intended to furnish initial insight into broad changes in Georgia's industrial structure. The table reflects the division of the state's economy into nineteen sectors of widely varying employment size and dynamism in terms of changes in employment.

Sixteen of the nineteen industry sectors experienced employment growth during the study period, a sign of a growing state economy. Five of these sectors--Health Care, Accommodation and Food Services, Information, Transportation and Warehousing, and Finance and Insurance--collectively accounted for 76.8 percent of total employment growth in the state. Two of these sectors—Manufacturing and Administration and

Support Services[11]—accounted for 99.2 percent of total employment loss. It is significant that the overwhelming majority of the employment decline was in just two sectors, an indicator of active structural change in those sectors. The job loss from manufacturing was expected as detailed in the Literature Review as a secular shift to the service sector but the decline in the Administration and Support sector was unexpected.

For the Administration and Support Services (Help Supply Services including temporary services) industry, the 22,047 net job loss was decomposed via the shift-share analysis into a 27,315 employment decline from local factors and a smaller 2,142 employment loss due to changes in industry mix. This finding suggests that while the industry was holding its own nationally as a proportion of economic activity, the substantial decline in the local factors component indicates that Georgia was reducing employment compared to the nation. A related industry, the Management of Companies, experienced a similar large decline in the local factors shift-share component.

In contrast, the job losses for the manufacturing sector—92,415 from the industry mix component and only 63 jobs gained based on local or competitive factors—was strongly indicative of an industry in the midst of large structural shifts nationally. Proportionately, the manufacturing sector was becoming a much smaller part of the national and the state economy.

Table 4.2 provides a less expansive, but more detailed, view of Georgia's economy during the study period than Table 4.1, focusing on job losses for the ten Georgia 3-digit NAICS industries with the largest decline in employment over the study

[11] The Administrative and Support Services industry (NAICS 56) includes Office Administration, Employment Services including Temporary Help, Business Support Services, Travel Agencies, Guard Services, and Building Custodial Workers.

Table 4.2. Georgia Shift-Share Employment Changes, 1999-2003
Ranked by Largest Decline in Employment

Description	NAICS	NS	IM	LF	EMP. CHNG.
Manufacturing Super-Sector	31-33	15,645	-101,564	6,324	-79,595
Administrative and Support Services	561	7,398	-4,423	-23,882	-20,907
Textile Mills	313	1,460	-19,328	2,211	-15,646
Apparel Manufacturing	315	587	-11,863	-2,074	-13,356
Transportation Eqmt. Manufacturing	336	1,395	-10,359	-916	-9,891
Computer & Electr. Product Manuf.	334	494	-5,847	-1,666	-7,019
Food and Beverage Stores	445	2,451	-6,833	-1,310	-5,691
Electrical Eqmt. & Component Manuf.	335	215	-2,120	-963	-2,868
Accommodation	721	1,185	672	-4,486	-2,623
Machinery Manufacturing	333	484	-4,295	1,535	-2,276
General Merchandise Stores	452	301	424	-2,556	-1,830

Source: County Business Patterns, 1999 and 2003, U.S. Census Bureau

period. This 3-digit NAICS industry analysis provides finer-grain detail of changes in industrial structure and was the basis for the subsequent analysis of job training program impacts on wages and the duration of unemployment.

Of the industries losing the most employment, six were in the manufacturing sector. Because of its central importance to Georgia's economy, the table includes a summary category for the manufacturing super-sector as a whole--NAICS 31-33--where employment declined by 79,595 between 1999 and 2003. In terms of employment loss, the Textile Mills sub-sector (NAICS 313) was second only to Administrative and Support Services and, when combined with Apparel Manufacturing (NAICS 315), accounted for a total of 29,002 jobs lost, 36.4 percent of the total employment loss for the industries losing jobs. This steep decline in manufacturing employment was indicative of large-scale structural changes in Georgia's economy and the potential demand for the job training services of the Georgia Department of Labor and their educational affiliates.

Other manufacturing job losses represented in Table 4.2 brought the total to 51,056 for the top 10 job losing industries, 62.2 percent of the total job loss. If the Administration and Support Services industry was excluded from the calculation, the manufacturing super-sector accounted for 83.4 percent of the total net job losses in the table. Other than the manufacturing sector, large employment losses were observed for Administrative and Support Services, Food and Beverage Stores and Accommodation (Hotels & Motels).

The NS employment component calculation is an indication of national economic growth as a whole. In Table 4.2, the share of employment growth resulting from the national share reflects the small but positive national growth of 2.4 percent over the study period. More important to this research on changes in employment due to structural and other economic changes, the IM and LF factors reflect shifts in the economy, the former nationally, the latter within the state of Georgia. The IM component can be indicative of nationally shifting industrial structure and the LF component a decline in local demand for a good or service. Both measures can reflect changes in labor productivity at the national or local levels, respectively. The data reveal comparatively large changes in both measures, though not simultaneously for a specific industry, reflecting different reasons for job losses by industry.

The IM component, tied to the national economy, reflects national industrial restructuring as relative employment in different industries shifts over time. Most of the declining industries in Georgia lost workers in the shift-share calculation because of national changes in the industry mix component. Georgia's manufacturing super-sector lost jobs because the U.S. gained productive efficiency in manufacturing, shedding many

workers in the process, while simultaneously losing ground to foreign competitors. In fact, the shift-share calculations revealed 6,324 jobs gained from local factors in manufacturing as the state slightly improved on its employment in that sector compared to manufacturing in the nation as whole. Similarly, the state's net loss in Textile Mills sub-sector employment—15,646—was primarily due to national industry mix factors in a declining industry which accounted for 19,328 jobs lost which were only partially offset by an improvement in local factors of 2,211 jobs.

The shift-share calculations revealed that much of the job loss in the state's top-ranked industries was due to the national decline of those industries in terms of employment. For example, Computers and Electronic Product Manufacturing, Electrical Equipment and Component Manufacturing, Transportation Equipment Manufacturing, and Machinery Manufacturing all lost the majority of workers due to the industry mix effect. For most of these industries, the losses due to the industry mix effect were exacerbated by further losses from the local factors effect. Only in the case of Machinery Manufacturing was the local factors component sufficient to offset a substantial amount of the job loss from the industry mix component. The Food and Beverage Stores industry lost 6,833 workers from the industry mix effect and 1,310 workers from local effects but these losses were offset to some extent by 2,451 in employment gains in the national share due to the large size of that industry's workforce (88,100) in the state during the 1999 base period.

The Administration and Support (Help Supply) Services, Accommodations, and General Merchandise Stores industries lost employment primarily because of local factors dominating the shift-share calculation. In the case of the Administrative and

Support Services and Accommodations, the cause of the employment losses was likely due to reduced local demand for those local-serving industries compared to those industries in the rest of the nation. For the local-serving General Merchandise retail sector, the explanation for job losses is more likely due to local improvements in labor efficiency compared to that industry nationally; perhaps due to the increasing presence of large, cost-efficient retailers.

In summary, the shift-share results showed that the largest sources of employment decline in Georgia during the study period were attributable to industry mix factors, indicative of the structural changes in the nation and Georgia that are a focus of this research. The industries most illustrative of these structural effects were in the manufacturing sector, led by losses in the Textiles, Computer and Electronic Products, and the Electrical Equipment and Component Manufacturing sub-sectors. Additionally, local competitive effects were found to be the sources of job losses in the Administration and Support and Accommodations industries.

4.1.1.2. Urban-Rural Shift-Share Employment Changes

4.1.1.2.1. Overview of the UR Scheme

Central place theory from the field of urban economics predicts a wider diversity of economic activity in urban areas compared to rural areas (O'Sullivan 1993). Important differences in employment choice, unemployment experiences, and workforce training needs, can arise from the dissimilar labor markets between urban and rural areas. Just as the size and diversity of labor markets constrain worker job choice, the fact that GDOL workforce development programs are implemented across many regional and local

jurisdictions poses constraints on the choice of job training services and, potentially, on programmatic outcomes.

The Urban-Rural (UR) Continuum from the U.S. Department of Agriculture (see Chapter 3) provides a useful dimension upon which many spatially variable socioeconomic variables can be mapped. Table 4.3, Georgia's Urban-Rural Area Populations and Average Per Capita Incomes, summarizes two of these variables. Figure 3.5 displays Georgia's urban-rural areas, the most prominent feature of which is the large urban region comprising the Atlanta Metropolitan Statistical Area (MSA) and surrounding counties. Table 4.4 presents the results of a shift-share analysis organized by the urban-rural areas. For each UR area, the top four industries with respect to employment decline are listed with net employment decline decomposed by National Share, Industry Mix, and Local or Competitive Factors.

4.1.1.2.2. Detailed Employment Impacts for the UR Areas

Twenty-eight counties of Georgia's most urbanized counties comprise level one of the Urban-Rural Continuum (UR 1) area, the largest of which are Fulton, DeKalb, Cobb, Gwinnett, and Clayton. Table 4.3 shows the UR 1 counties had the largest concentration of population in the state, 4,247,981, and were the relatively richest, $24,785 annual per capita income. The UR 1 area hosts the common economic activities associated with maintaining any community including transportation, and retail distribution and, in addition, many other specialized activities associated with this area's unique economic function in the state such as a disproportionate number of corporate headquarters, large government organizations including the state government, very large shopping malls, and specialized medical care.

Table 4.3. Urban-Rural Area Population and Average Per Capita Income

UR Code	Population	Average Per Capita Income ($)
1	4,247,981	$24,785
2	987,038	$18,909
3	1,291,436	$17,988
4	319,753	$16,360
6	853,006	$15,709
7	257,021	$14,469
8	140,854	$15,601
9	89,364	$16,250

Source: Author's calculations from U.S. Census 2000 SF3 files

The Administration and Support industry (NAICS 561) lost the largest amount of net employment in the UR 1 area over the study period (Table 4.4). The net loss of 23,378 jobs in this sector was driven by an even larger local factor loss of 25,958 jobs. The Administration and Support sector was heavily concentrated in the Atlanta region. Although several other UR areas—UR 4, UR 7—experienced net NAICS 561 job losses and several others gained some employment—UR 2, UR 3, and UR 6—the numbers were small compared to those in UR 1.

The Computer and Electronic Product Manufacturing industry, which geographically clusters in urban areas, has also lost substantial employment, almost six thousand jobs over the study period, most due to industry mix factors reflecting the eclipse of the manufacturing sector nationally. The coincident decline of both services and manufacturing industries may pose a capacity problem for Atlanta area workforce training entities if workers from both sectors seek job training in large numbers. Apparel Manufacturing lost substantial employment, reflected by a dominant IM shift-share component. The decline of Apparel in the UR 1 suburban areas indicates the geographic

Table 4.4. Urban-Rural Shift-Share Employment Changes, 1999-2003, Top Four Ranked by Largest Decline in Employment

NAICS Descriptor	NAICS	U-R Code	Urban-Rural Descriptor	NS	IM	LF	EMP
Administrative and Support Services	561	1	Metro >= 1M	5,538	-2,957	-25,958	-23,378
Computer and Electronic Product Manuf.	334	1		420	-4,974	-1,417	-5,972
Apparel Manufacturing	315	1		257	-5,178	-315	-5,236
Accommodation	721	1		615	348	-4,325	-3,364
Textile Mills	313	2	Metro >= 250,000	465	-6,148	-1,256	-6,939
Food and Beverage Stores	445	2	and < 1M	258	-721	-1,018	-1,479
General Merchandise Stores	452	2		224	79	-1,462	-1,158
Fabricated Metal Product Manufacturing	332	2		103	-755	-326	-978
Apparel Manufacturing	315	3	Metro < 250,000	309	-6,126	-466	-6,283
Textile Mills	313	3		387	-5,109	1,916	-2,806
Transportation Equipment Manufacturing	336	3		120	-912	-1,477	-2,269
Food and Beverage Stores	445	3		320	-887	-655	-1,225
Textile Mills	313	4	Urb. Pop. >= 20,000	195	-2,605	512	-1,898
Transportation Equipment Manufacturing	336	4	adjacent to metro	68	-499	-851	-1,282
Fabricated Metal Product Manufacturing	332	4		50	-364	-498	-812
Machinery Manufacturing	333	4		46	-407	-350	-712
Textile Mills	313	6	Urb. Pop. >= 2,500	152	-1,995	-156	-1,999
Textile Product Mills	314	6	to 19,999	152	-1,121	-769	-1,738
Transportation Equipment Manufacturing	336	6		66	-599	-715	-1,248
Furniture and Related Product Manuf.	337	6	adjacent to metro	46	-225	-469	-648
Apparel Manufacturing	315	7	Urb. Pop. >= 2,500	22	-447	-261	-686
Fabricated Metal Product Manufacturing	332	7	to 19,999	60	-438	-261	-638
Machinery Manufacturing	333	7		12	-111	-258	-357
Food and Beverage Stores	445	7	not adj. to metro	60	-168	-132	-239
Food and Beverage Stores	445	8	Rural or Pop. < 2500	22	-62	-176	-216
Textile Product Mills	314	8	adjacent to metro	42	-292	52	-198
Clothing and Clothing Accessories Stores	448	8		5	25	-172	-141
General Merchandise Stores	452	8		6	8	-138	-126
Accommodation	721	9	Rural or Pop. < 2500	35	75	-297	-187
Fabricated Metal Product Manufacturing	332	9	not adj. to metro	3	-20	-84	-101
Truck Transportation	484	9		6	1	-39	-32
Personal and Laundry Services	812	9		2	1	-21	-18

Source: County Business Patterns, 1999 and 2003, U.S. Census Bureau

sweep of decline in the Textiles sector. The Accommodations industry also had very substantial job losses in UR 1, most attributable to local factors. While Accommodations maintained employment nationally, the shift-share calculation shows that the Atlanta, region experienced large reductions in employment. This finding for UR 1 suggests that the City of Atlanta, long known for its convention and hospitality industries, has lost ground nationally to other cities.

The UR 1 area can be characterized not only by a huge population and a large potential clientele for GDOL job training services but also by the wide scope of economic activities taking place in them. Encompassing both the services and manufacturing sectors, the UR 1 area encompasses several Workforce Investment Areas (WIAs), providing an organizational challenge to region-wide coordination. A more inclusive Atlanta regional workforce development system than the WIAs would be better suited to administer job training services to such a wide geographic area.

The second level of the UR continuum in Georgia consists of 14 counties containing at least one large metropolitan area such as Savannah (Chatham County), Columbus (Muscogee County), and Augusta (Richmond County). The UR 2 areas are less populated than either the UR 1 or UR 3 areas but rank second with respect to per capita income, $18,909 annually. The largest employment loss in UR 2 was found in the Textiles Mills industry: 6,939 net workers, the largest of any UR area. Much of Georgia's textile industry is located in the northeast corner of the state in Walker, Dade and Catoosa counties and in the west, in Muscogee County. During the study period, the Textiles industry in UR 2 was undergoing great structural change with resulting large unemployment; a potentially large client base for GDOL job training services. Food and

Beverage Stores and General Merchandise Stores also lost employment, most due to local factors. The reason for the decline of these two related industries cannot be ascertained within the scope of the current research but it is possible that the continued rise of large-scale retailing operations (Walmart, etc.) may account for the decline of small "mom-and-pop" stores which previously had accounted for much employment. The job training services required by decline in these industries in the service sector presents a different challenge to GDOL than does Textiles in the manufacturing sector.

The third level of the UR continuum, UR 3 is comprised of 28 counties with at least one medium-sized metropolitan area, among them Rome (Floyd County), Albany (Dougherty), Valdosta (Lowndes), Brunswick (Glynn), Macon (Bibb), Athens (Clarke), Dalton (Whitfield), and Gainesville (Hall County). The largest loss of employment was in the Apparel Manufacturing industry. The Dalton/Whitfield County area has been a center for Apparel and Textile production for decades but low-cost competitors continue to steadily erode that employment base (-9,089 jobs) as the shift-share analysis shows. Second largest industry loser was Textile Mills which lost 2,806 jobs, reflecting a large negative –5,109 industry mix component resulting from the decline of that sector nationally. The positive local factors shift-share component showed that, at least in the UR 3 areas, employment in the Georgia Textiles sector has kept pace with rest of the nation. Employment in the Transportation Equipment Manufacturing industry declined by 2,269 from a combination of industry mix and local factors suggesting that the Transportation Equipment Manufacturing industry was becoming a smaller part of both the national and the UR 3 economy. Like UR 2, the Food and Beverages Stores lost substantial employment.

The UR 4 region consists of only seven counties with small towns near a large metropolitan area in the middle of the state--Lagrange (Troup County) and Milledgeville (Baldwin County)--and the southern part-- Waycross (Ware County), Tifton (Tift County), Thomasville (Thomas County), St. Mary's (Camden County and the King's Bay nuclear submarine base), and Statesboro (Bulloch County). The UR 4 areas had significantly less per capita income than the top three UR levels; only $16,360, about two-thirds of the per capita income of the UR 1 area. Leading the job-losing industries in the UR 4 areas was Textile Mills with employment losses of 1,898, chiefly because of the concentration of textile activity near Lagrange. As in the UR 3 areas, the industry mix shift-share component accounted for a net loss of jobs while the local factor accounted for a gain in jobs, again a refection of the state's continuing competitiveness in a nationally declining industry. Transportation Equipment Manufacturing ranked second in terms of jobs lost—1,282. The related Fabricated Metal Product Manufacturing industry lost 812 jobs, evenly split between industry mix and competitive factors. Machinery Manufacturing experienced a net loss of employment, 712 workers, again evenly divided between the industry mix and competitive shift-share components. Unlike the UR 1-UR 3 areas, manufacturing accounted for all job losses among the top four job-losing sub-sectors in UR 4.

The UR 6 area is composed of the largest number of counties of any of the UR areas--41 counties near a metropolitan area with one or more small towns. Compared to the more urbanized areas, the UR 6 area is relatively poor; only $15,709 annual per capita income. Americus (Sumter County), Calhoun (Gordon County), Moultrie (Colquitt County), Cairo (Grady County), and Bainbridge (Decatur County) are the largest

urbanized areas in UR 6. As was the case with UR 4, the top-four job-losing industries in UR 6 were all in manufacturing sector. Textiles and Textile Mill Products accounted for most of the employment decline; 3,737 jobs. The industry mix shift-share component accounted for 83.4 percent of net job loss in UR 6 Textile industries, indicative of these nationally declining industries. Transportation Equipment Manufacturing lost 1,248 workers, many at the Bluebird school bus production facility in Peach County.

The fifteen UR 7 counties contain small towns not situated near a metropolitan area. The UR 7 counties are the poorest of any of the UR areas in Georgia with a $14,469 per capita annual income. Most of the UR 7 counties are located in southeast Georgia with small towns such as Baxley (Appling County), Douglas (Coffee County), Vidalia (Toombs County), and Swainsboro (Emanuel County). Apparel Manufacturing and Fabricated Metal Product Manufacturing were the top two job-losing industries. National industry mix factors accounted for 66.8 percent of this employment decline.

The UR 8 counties, fifteen of them are scattered around the state, are rural and are situated near a metropolitan area. Colquitt (Miller County) is the most significant urbanized area in UR 8. Annual per capita income was second lowest of any UR area. The Food and Beverage Stores industry topped the list of employment losses in UR 8 followed by Clothing and Clothing Accessories Stores and General Merchandise Stores. The total net job loss among the top four industries in UR 8 was only 681 jobs, and except for Textile Products Mills, due chiefly to local competitive factors. One possible explanation for these employment losses may have been the rise of the more efficient "big box" retailers which may have adversely affected employment in smaller, more labor-intensive, retail outlets.

The UR 9 areas consist of eleven rural counties spanning from north to south Georgia, none near a metropolitan area. The Accommodations industry lost the greatest number of workers, 187, and the Fabricated Metal Product Manufacturing industry second most, 101, almost all due to local factors. The other two top-ranked job-losing industries, Truck Transportation and Personal and Laundry Service, lost only fifty employees between them. Compared to the more urban URs, these sparsely settled UR 9 counties had very few employment losses making job training service delivery inefficient for both the GDOL and trainees.

4.1.1.2.3. Implications for GDOL Job Training Services

Georgia's UR continuum areas differ greatly in terms of population size and the degree of urbanity/rurality. Net job loss by industry in UR 1, the largest UR area, was paced by the Administration and Support Services and the Accommodations industries and characterized by large decreases in the local competitive factors shift-share employment component. This finding suggests that GDOL job services could efficiently be targeted toward this large concentration of former service workers in the UR 1 area, primarily the geographically interior Atlanta counties. Job losses were not confined to the services sector, however, with Computer and Electronic Product and Apparel manufacturing also experiencing large reductions.

Except for UR areas 8 and 9, all areas experienced substantial declines in manufacturing employment, most often characterized by large decreases in the industry mix shift-share employment component. In UR areas 2, 3, 4, 6, and 7 the top-ranked job-losing industries were in the manufacturing sector. The Textiles and Apparel sector was cumulatively the largest employment-losing manufacturing industry with 29,002 jobs

lost. In UR areas 2, 4, 7, and 9, Fabricated Metal Product Manufacturing was also a prominent job-losing industry. These broad changes in the manufacturing sector indicate that the GDOL should focus job training services in these UR areas. This strategy is made problematic by the wide geographical expanse of the areas affected by the decline of the manufacturing sector and the potential organizational fragmentation inherent in the WIA system.

The shift-share analysis attributed employment decline to either industry mix or local competitive factors (the national share component was positive and very small over the study period). A decrease in the industry mix factor is a consequence of the national decline of a specific industry vis-à-vis other industries, at least with respect to employment. A decrease in the shift-share local factor reflected a decline in the employment of a local industry compared to that same industry elsewhere in the nation. Both shift-share factors point toward different aspects of economic change. The IM effect is often associated with structural change as specific industries grow or decline as technology and import-export patterns change. The LF effect also reflects change as local industries decline in employment or reorganize to take advantage of a larger scale of production, or relocate production to lower wage areas, thus saving labor costs. Both these processes of economic change produce an excess of labor, increasing unemployment and providing potential clients for job training services.

The state-level and UR shift-share analyses point toward different sources of employment change (IM or LF components) for different industry sectors (services and retail in larger urban URs, manufacturing and retail in most of the rural URs) and different worker-trainee populations with different training needs. This diversity of the

worker population has important implications for which training services the GDOL provides and where they provide them. For LF job loss in the Administrative Support Services industry, retraining in a new field may be less useful than re-connecting job-losers to similar jobs, either locally or via worker mobility. For manufacturing workers, retraining in that sector may not be a useful option because of IM shifts that mean the jobs will not return. Given the reluctance of many workers to relocate, retraining would only be effective if the occupations trained for are those demanded by local industries.

4.1.1.3. Workforce Investment Area (WIA) Shift-Share Employment Changes

4.1.1.3.1. Overview of the WIA Scheme

The Urban-Rural Continuum is based on measurable differences between geographical areas in terms of population size and adjacency to metropolitan areas. Central place theory predicts that the type and intensity of economic activities in each urban-rural area category will vary, potentially leading to significant differences in labor markets and associated impacts from job training services on the wage and job search times of job training participants versus non-participants. In contrast, the GDOL Workforce Investment Areas (WIAs) were created for administrative and political reasons to facilitate the funneling of federal funds to the Georgia Department of Technical and Adult Education (DTAE) and other education service providers and to enforce the uniform quality-of-service requirements that flow down from the U.S. Department of Labor (USDOL) to state and local agencies and their contractors.

Georgia's WIAs are a diverse group of economic regions ranging from the county-size urbanized WIAs of Atlanta to the rural WIAs which can be comprised of as many as seventeen contiguous counties. In compliance with U.S. Workforce Investment

Act, the state of Georgia has established twenty WIA service areas in Georgia (Figure 3.6). Each WIA has at least one full-service One-Stop Center from which a range of workforce services, including job training, are made available to job seekers and employers (GDOL 2004). The Georgia WIA system builds on the system of workforce development services currently provided through the state's technical colleges and the GDOL One-Stop Career locations, local WIA programs, and vocational rehabilitation services.

This research recognizes that even with uniform program requirements, important differences in job training program function and effectiveness may exist due to administrative and other local socio-economic factors beyond the scope of the current research. The purpose of this WIA-level research is to identify via shift-share analysis the industries losing the most workers and subsequently use regression analysis to assess differences in the wage and job search times between the WIAs, if any, but it will be left to future research to detail the causes of these differences.

4.1.1.3.2. Detailed Employment Impacts for the WIAs

This section briefly surveys each of the WIAs, identifying the salient characteristics that have implications for the workforce development system (WDS) and its users. The spatial pattern of structural unemployment, as revealed by the WIA-level IM and LF shift-share factors, is important to an understanding of the composition and capacity required of the WDS.

Much of Georgia's Textile industry is located in the Northwest WIA 1. Table 4.5 shows a net loss of 2,702 jobs in the Textile Mills and Apparel industries during the study period, most of which were attributable to industry mix effects from this nationally

declining sector. The Home Furnishings Stores industry also declined in the Northwest WIA, mostly due to local factors suggesting a decrease in local demand. Most net employment loss in WIA 2, located in the northeast corner of the state, occurred in three industries in the manufacturing sector: Apparel Manufacturing, Wood Products Manufacturing, Miscellaneous Manufacturing. Apparel decline was due to industry mix factors but job losses in the other two industries were due to local competitive factors rather than broad industry factors.

Table 4.5. WIA Shift-Share Employment Changes, 1999-2003
Top Three Ranked by Decline in Employment

NAICS Descriptor	NAICS	WIA	NS	IM	LF	EMP
Textile Mills	313	1	293	-3,880	885	-2,702
Apparel Manufacturing	315	1	79	-1,604	-301	-1,826
Furniture and Home Furnishings Stores	442	1	58	103	-1,206	-1,045
Apparel Manufacturing	315	2	52	-1,057	-198	-1,203
Wood Product Manufacturing	321	2	26	-149	-479	-602
Miscellaneous Manufacturing	339	2	41	-101	-461	-521
Administrative and Support Services	561	3	1,196	-639	-10,442	-9,885
Repair and Maintenance	811	3	161	-231	-2,675	-2,745
Accommodation	721	3	531	301	-2,008	-1,174
Administrative and Support Services	561	4	607	-325	-6,484	-6,201
Computer and Electronic Product Manuf.	334	4	53	-616	-836	-1,401
Accommodation	721	4	92	52	-1,074	-931
Administrative and Support Services	561	5	444	-237	-4,248	-4,041
Insurance Carriers and Related Activities	524	5	88	-15	-1,677	-1,604
Computer and Electronic Product Manuf.	334	5	62	-740	-447	-1,125
Computer and Electronic Product Manuf.	334	7	154	-1,828	-1,105	-2,778
Administrative and Support Services	561	7	605	-322	-2,472	-2,191
Transportation Equipment Manufacturing	336	7	262	-1,948	-172	-1,860
Apparel Manufacturing	315	8	63	-1,273	-743	-1,953
Administrative and Support Services	561	8	85	-46	-800	-761
Transportation Equipment Manufacturing	336	8	101	-751	-66	-717
Transportation Equipment Manufacturing	336	9	78	-577	-51	-551
Food Manufacturing	311	9	53	-6	-263	-216
Machinery Manufacturing	333	9	33	-299	87	-178
Ambulatory Health Care Services	621	10	119	607	-1,279	-553
Management of Companies and Enterprises	551	10	26	9	-511	-477
Educational Services	611	10	70	337	-782	-375

Table 4.5. (continued)

Transportation Equipment Manufacturing	336	11	134	-996	-88	-951
Food and Beverage Stores	445	11	61	-172	-338	-450
Plastics and Rubber Products Manuf.	326	11	8	-47	-94	-133
General Merchandise Stores	452	12	72	26	-1,203	-1,106
Food and Beverage Stores	445	12	55	-152	-385	-482
Personal and Laundry Services	812	12	25	14	-308	-268
Fabricated Metal Product Manufacturing	332	13	11	-81	-255	-325
Food and Beverage Stores	445	13	60	-165	-138	-243
Food Services and Drinking Places	722	13	66	186	-451	-199
Textile Mills	313	14	108	-1,430	-811	-2,133
Apparel Manufacturing	315	14	56	-1,142	-667	-1,753
Food and Beverage Stores	445	14	61	-170	-345	-454
Apparel Manufacturing	315	15	31	-627	-366	-962
Furniture and Related Product Manuf.	337	15	12	-59	-274	-321
Food and Beverage Stores	445	15	22	-64	-168	-209
Apparel Manufacturing	315	16	24	-490	-286	-752
Food and Beverage Stores	445	16	64	-181	-408	-523
Fabricated Metal Product Manufacturing	332	16	37	-271	35	-199
Transportation Equipment Manufacturing	336	17	115	-858	-76	-819
Food and Beverage Stores	445	17	83	-232	-337	-485
Miscellaneous Store Retailers	453	17	25	-38	-441	-453
Gasoline Stations	447	18	41	-28	-377	-365
Food and Beverage Stores	445	18	58	-163	-196	-301
Chemical Manufacturing	325	18	10	-32	-219	-240
Wood Product Manufacturing	321	19	21	-102	-431	-512
Fabricated Metal Product Manufacturing	332	19	17	-120	-324	-427
Gasoline Stations	447	19	28	-18	-126	-120
Fabricated Metal Product Manufacturing	332	20	35	-257	-429	-651
Food and Beverage Stores	445	20	143	-402	-152	-409
Machinery Manufacturing	333	20	19	-172	-11	-163

Source: County Business Patterns, 1999 and 2003, U.S. Census Bureau

The combined City of Atlanta and Fulton County WIA 3, the second largest in the state with respect to population, had the highest per capita income, $30,003 annually, 41.8 percent above the state average (Table 4.6). The Administration and Support Services industry experienced a decline of 9,885 net jobs with a local competitive shift-share component of –10,442 jobs, reflecting a local excess of labor in this industry. Similarly, the Accommodations service industry lost 1,174 net jobs with a LF component of –2,008, also indicative of a local, not national, decline in employment. The Repair and

Maintenance industry (auto, truck, and electronic) also lost ground, again primarily from local job factors. Job loss from local factors signals employment change, not from foreign competition as is often the case with manufacturing, but due to declining local demand or local improvements in organization or technology. Located in the center of the Atlanta region, WIA 3 provided unemployed workers quick geographic access to employment opportunities in the state's largest labor market. Job losses in WIA 3 were in both service and manufacturing industries so worker, and job trainee, access to Atlanta's diverse economy was also important.

WIA 4, Cobb County, per capita income in 1999 was $27,863, 31.7 percent greater than the state average. As with WIA 3, the largest job loss, 6,201, was in the

Table 4.6. WIA Population and Average Per Capita Income

WIA Code	Population	Income ($)
1	697,410	$17,673
2	455,342	$20,824
3	816,006	$30,003
4	607,751	$27,863
5	665,865	$23,968
7	1,339,757	$23,484
8	403,944	$18,186
9	423,417	$18,550
10	153,887	$19,058
11	286,234	$18,101
12	222,018	$16,692
13	217,489	$18,310
14	250,364	$17,931
15	116,997	$14,870
16	272,894	$14,568
17	352,880	$15,678
18	226,892	$15,741
19	138,033	$14,301
20	539,273	$19,005

Source: Author's calculations from U.S. Census 2000 SF3

Administration and Support services industry. Employment in the Computer and Electronics Manufacturing and Accommodations industries also declined. Administration and Support Services lost most of the net employment in DeKalb County, WIA 5, as did the Insurance Carriers and Computer and Electronic Manufacturing industries. Changes in local factors in the Administration and Support Services and the Insurance Carriers industries accounted for most job loss.

WIA 7, the Atlanta Regional WIA, is comprised of several non-contiguous suburban counties surrounding the City of Atlanta and Fulton County: Cherokee, Gwinnett, Douglas, Henry, Rockdale, Clayton, and Fayette. WIA 7 has the largest population of any WIA and one of the highest per capital incomes, $23,484, 11.1 percent above the state average. WIA 7 received 18.2 percent of the state's aggregate per capita income, the most of any WIA. The Atlanta Regional WIA lost substantial employment in the Computer and Electronic Manufacturing industry, a net loss of 2,278 jobs, mostly from industry mix factors. Transportation Equipment Manufacturing employment also declined by a net 1,860 workers from changing industry mix bringing the loss in the manufacturing sector for WIA 7 to 4,368. As with the other metropolitan Atlanta WIAs, Administration and Support Services declined in significance due to local factors. WIA 7 was unique among the Atlanta regional WIAs because most job loss was in manufacturing, not the service sector. This suggests that the mix of educational and job training services offered by WIA 7 should probably differ from that of the other Atlanta areas WIAs.

The West Central WIA 8 stretches from the southwest Atlanta area to south of LaGrange and contains much of the state's textile-related industry. Apparel

Manufacturing accounted for the largest net employment decline during the study period, 1,953, most of which was attributable to industry mix factors, the likely consequence of the off-shoring of production. The decline of the Textile sector in Georgia affects many related industries, from the production of cloth in the Textiles Mills industry to its use as an input to the Apparel industry. The Transportation Equipment Manufacturing industry declined by 717 jobs, almost all due to changes in industry structure, probably from foreign competitors.

The Northeast WIA 9 extends from west of the Atlanta area to the South Carolina border. Transportation Equipment Manufacturing, Food Manufacturing, and Machinery Manufacturing accounted for a total net loss of 945 jobs, small by the standards of large urban areas but significant in the local rural economy. Food Manufacturing declined from shifting local factors but the shift-share analysis indicated losses in Transportation Equipment and Machinery Manufacturing were due to industry mix factors.

WIA 10, Bibb County, is geographically small compared to the WIAs outside the Atlanta area and was near the mid-range in terms of average per capita income. The top three job-losing industries were Ambulatory Health Care Services, Management of Companies and Enterprises, and Educational Services due wholly to local factors which was partially offset by 1,168 jobs due to national share and industry mix effects. The Middle WIA 11 surrounds the Bibb County WIA and accounted for 3.0 percent of the aggregate per capita income, very high for a WIA located in the southern part of the state. This was probably due to WIA 11's location in a suburban area proximate to Macon and Warner Robins. The Transportation Equipment Manufacturing and retail Food and Beverage Stores industries accounted for most of the net loss of workers. The former lost

ground to industry mix effects but Food and Beverage Stores declined because of local factors, perhaps due to the rise of large retail operations in rural areas.

The Richmond County/Burke County WIA 12 borders South Carolina. General Merchandise Stores and Food and Beverage Stores were the top two job-losing industries. These two retail industries cumulatively lost net workers due to local competitive effects, possibly due to the growth of large-scale discount retail stores. The East Central WIA 13, Jenkins and Screven counties, is situated between the Richmond/Burke County WIA and the Coastal WIA. Again, Food and Beverage Stores lost employment, as did Fabricated Metal Product Manufacturing and Food Services and Drinking Places, mostly from local competitive effects.

WIA 14, which includes Columbus, hosts much of Georgia's textiles industry. Specifically, the Textiles Mills industry lost a large number of net jobs, 2,133, mostly due to industry mix factors and, to a lesser degree, local competitive effects. Also losing employment were the Apparel Manufacturing and Food and Beverage Stores industries. The Middle Flint WIA 15 lost net workers in the Apparel Manufacturing, Furniture and Related Product Manufacturing, and Food and Beverage Stores industries. The loss of jobs in grocery stores in WIA 14 is similar to losses in many of the other WIAs. WIA 16, the Heart of Georgia, was the state's second poorest with respect to average per capita income: $14,568. Apparel Manufacturing, Food and Beverage Stores, and Fabricated Metal Product Manufacturing lost a net total of 1,474 workers. The greatest net employment decline in the Southwest WIA 17 was in Transportation Equipment Manufacturing, followed by Food and Beverage Stores and Miscellaneous Store Retailers, both retail industries. Like many of the rural WIAs, the Southwest was losing

retail employment, likely to the more efficient large-scale retailers. WIA 18, the South WIA, lost employment in the Wood Product Manufacturing and Fabricated Metal Product Manufacturing industries. WIA 19, the Southeast WIA, was the state's poorest with an average per capita income of only $14,301 annually, only 47.7 percent of the WIA 3 average. Wood Product Manufacturing, Fabricated Metal Product Manufacturing and Gasoline Stations lost jobs mostly due to local factors. Summarizing these mostly rural WIAs, most job losses were in the manufacturing sector but substantial decline was observed in retail industries as well.

The Coastal WIA 20 experienced levels of job loss similar to most other south Georgia WIAs but on a much larger population base—539,273 persons compared to 225,000-275,000—and a much larger average annual per capital income of $19,005. Compared to the other south Georgia WIAs, the Coastal WIA is larger and more wealthy. However, the net loss of employment was comparable to the other south Georgia WIAs. This decline in employment was primarily due to the Fabricated Metal Product Manufacturing and Food and Beverage Stores industries; mostly due to national industry mix effects.

4.1.1.3.3. Implications for GDOL Job Training Services

Similar to the larger Urban-Rural Continuum areas UR 1-UR 3, the most populated WIAs experienced a very substantial decline in employment in the Administration and Support Services industry. Several of these most populous WIAs—Cobb County, DeKalb County and the Atlanta Regional WIAs—also lost employment in the Computer and Electronic Manufacturing industry but most job losses from the manufacturing sectors occurred in the rural WIAs. Many of the rural WIAs also

experienced substantial job losses in the retail sector, Food and Beverage Stores and General Merchandise Stores in particular. While many of these rural WIAs lost retail jobs, employment decline in the manufacturing sector was a more consistent theme. Depending on the WIA, the manufacturing industry involved varied, but prominent were the Fabricated Metal Product Manufacturing, Food Manufacturing, and Machinery Manufacturing industries. Textiles-related industries—Textiles Mill Manufacturing and Apparel Manufacturing—lost the most manufacturing employment.

Similar to the UR shift-share analysis, the WIA analysis determined that employment decline was attributable to changes in both the national industry mix and local competitive factors. Both these processes of economic change produced an excess of labor, increasing unemployment and providing potential clients for the GDOL workforce development system.

The UR shift-share analysis, based on areal variations in population size, indicated that employment decline in the urban areas occurred primarily in the service sector while job loss in the rural areas was mostly due to a decline in the manufacturing sector. The WIA-level shift-share analysis verified this finding with a somewhat more fine-grained geography. The job training services needs of urban workers exiting industries such as Administration and Support Services are distinctly different from the needs of rural workers leaving the manufacturing sector. The former are more likely to need a quick re-connection to other job opportunities while the latter workers may require retraining for a new field currently demanded by employers.

The WIA shift-share analysis, based on administratively defined GDOL geographic boundaries (also with population size attributes), provided insight into the

spatial challenges faced by the GDOL in their mission to uniformly deliver job training services to all areas of the state. The geographic variation in the industries losing employment was a test for the GDOL system in terms of the effective provision of job training services to a diverse and dispersed client population. A subsequent section will address the wage and duration of unemployment effects of the specific job training services offered by and through the GDOL.

4.1.2. Identification of Georgia's Declining Industries

Table 4.2 summarized the results of the 3-digit NAICS state-level shift-share analysis, presented in ranked order of employment loss during the 1999-2003 study period. The manufacturing super-sector ranked first with a total net loss of 79,595 jobs (Table 4.1) followed by the Administrative and Support Services industry with 20,907 jobs and then by the Textiles Mills and Apparel industries, subsets of the manufacturing sector, with a combined net loss of 29,002 jobs. The industry descriptor data in Table 4.2, derived from County Business Patterns, is organized by NAICS code. The GDOL datasets were organized by SIC codes so a look-up table was required to identify the top-declining industries for the GDOL job- training analyses. Table 4.7, a listing of declining industries in the state of Georgia during the study period, was derived from Table 4.2 with the appropriate industry code translation based on the U.S. Census Bureau's 1997 NAICS and 1987 SIC Correspondence Table. Three-digit NAICS industries are represented by one or more SIC industries via the Correspondence Table.

Table 4.7 includes all the declining industries identified in Table 4.2 and provides the basis for the subsequent state-level, Urban-Rural Continuum, and Workforce Investment Area regression analyses. In addition to the sectors presented in Table 4.7,

Table 4.7. List of Declining Industries in Georgia, 1999-2003

Administrative and Support Services (SIC 7361, 7363, others)
Food and Beverage Stores (SIC 5411-5499, others)
General Merchandise Stores (SIC 5311, 5331, 5399)
Hotels and Motels (SIC 7011)
Manufacturing (SIC 2011-3999)
Textiles Sector (SIC 2211, 2273, 2281, others)
Machinery Manufacturing (SIC 3523-3599)
Transportation Equipment Manufacturing (SIC 3711-3799)
Computer & Electronic Prod. Manuf. (SIC 3570-3829, others)
Electrical Equipment Manufacturing (SIC 3612-3699, others)

separate analyses were performed for all of the selected declining industries as a group and the selected manufacturing industries as a group. The Textiles Sector was also analyzed as a composite group consisting of the Textiles Mills (NAICS 313), Textile Product Mills (NAICS 314, not listed in Table 4.2) and the Apparel (NAICS 315) industries.

4.2. Identification of the Workers Leaving Georgia's Declining Industries

4.2.1. Declining Industry Leavers and the Job Training Services Received

4.2.1.1. Data Availability for the Job Training Services Impact Analyses

The data necessary for assessing the wage and job search impacts from GDOL job training services included: 1) wage data and employment history for individual workers, 2) industry data by SIC for their employing firms; 3) verification of unemployment status (Unemployment Insurance records); 4) job training data for individual workers; and 5) cost data for specific job training services. Most of the data were supplied to this

research by the GDOL for the study period, 1999-2003, the exception being the cost of Skills Upgrade training obtained from subcontractors.

During the study period, the WIAs did not systematically segregate cost accounting data or report the cost of providing specific job training services to individual trainees, as required by the cost-effectiveness analysis described in the Chapter 3 Methodology section of this research. The WIAs, and therefore the GDOL, tracked costs by program source (Adult & Youth, Dislocation, Title II and III, etc.) and not by the specific job training service rendered. From the Atlanta Regional WIA[12], affiliated with the Atlanta Regional Commission, this research received limited cost data by job training service rendered for a cross-section of the Atlanta Regional counties.

The Atlanta Regional WIA supplied data for Core and Intensive services which had been combined into a single category[13] even though the services were provided in-house at the WIA One-Stop offices. For reasons of accounting to the USDOL, the Atlanta Regional WIA also had data for Occupational Skills training even though the service was supplied in-house under contract with external firms. The other training service categories were not available from the Atlanta Regional, or any, WIA contacted[14]. Information on Skills Upgrade training was obtained directly via an Atlanta Regional WIA list of eligible job training service providers who were able to supply detailed cost data. The listed training service providers provided data for Skills Upgrade training but

[12] Interviews with Mark Hannon White and Hayden Braithwaite of the Atlanta Regional WIA between July and September of 2007.
[13] Relatively few Core services records were evident in the statewide GDOL datasets even though the WIA program requires passage for all clients through this lowest tier of the training services system.
[14] Other potential sources of the job training service cost data—DeKalb, Cobb, and several other WIAs–were unable to provide the requested information.

provided no data for others (Mentoring, for example). Fortunately, the training categories for which data were available comprised 82.2 percent of the total number of the job training participants tracked in the GDOL data.

Table 4.8 presents descriptive statistics for the primary variables in the regression analysis for declining industries as a group. The long-term unemployed (LTU) population was 3.5 years older than the non-LTU population and slightly more female (5.8 percent) and non-white (6.5 percent). The LTU workers also participated in job training at a rate three times the non-LTU population. Importantly, the LTU population experienced a drop of $914 in wages when re-employed compared to the non-LTU group who gained $586 in wages. The LTU group required over three quarters longer to find new work.

This research addressed the efficacy of GDOL job training services for workers leaving the declining industries identified in Table 4.7. Workers leaving these industries and regaining stable employment for a period of six months or more had the choice of availing themselves of GDOL training or not. Table 4.9 summarizes the counts of exiting workers by industry and by the job training services they completed. The eight job training services categories are listed across the top of the table (COR = Core services, INT = Intensive, REM = remedial/basic skills, OJT = on-the-job training, MEN = Mentoring, JOB = extended job search, and SKI = skills upgrade training services). Because many workers received more than one job training service, a composite category (JTR) was created to provide a non-redundant count of workers receiving at least one training service. Table 4.9 is divided into workers not experiencing long-term

Table 4.8. Descriptive Statistics for Declining Industries

Not Long-Term Unemployed					
Variable	**Obs.**	**Mean**	**Std. Error**	**Min.**	**Max.**
Age	**378,355**	**35.0**	**0.040**	**16**	**93**
Female	**378,355**	**0.52**	**0.002**	**0**	**1**
White	**378,355**	**0.49**	**0.002**	**0**	**1**
Job Train	**378,355**	**0.04**	**0.001**	**0**	**1**
Pre-Wage	**378,355**	**$5,849**	**$17**	**$203**	**$102,340**
Post-Wage	**378,355**	**$6,435**	**$17**	**$212**	**$99,761**
Wage Diff.	**378,355**	**$586**	**$11**	**-$78,619**	**$76,330**
Qtrs. Unemp.	**378,355**	**0.07**	**0.001**	**0**	**1**
Long-Term Unemployed					
	Obs.	**Mean**	**Std. Error**	**Min.**	**Max.**
Age	**32,117**	**38.5**	**0.094**	**16**	**82**
Female	**32,117**	**0.55**	**0.004**	**0**	**1**
White	**32,117**	**0.46**	**0.004**	**0**	**1**
Job Train	**32,117**	**0.12**	**0.003**	**0**	**1**
Pre-Wage	**32,117**	**$6,777**	**$46**	**$206**	**$75,427**
Post-Wage	**32,117**	**$5,862**	**$38**	**$218**	**$57,602**
Wage Diff.	**32,117**	**-$914**	**$36**	**-$60,942**	**$42,644**
Qtrs. Unemp.	**32,117**	**3.18**	**0.011**	**2**	**9**

unemployment and those unemployed for six or more months prior to regaining stable employment.

4.2.1.2. The Non-LTU Worker Population

The count of non-LTU trainees with a period of six or more months of stable employment both pre- and post-transition from all declining industries was 15,663 from a total of 378,355 non-LTU worker records; an average of 4.1 percent received training services. By definition, the non-LTU worker population regained employment relatively quickly, which explains in part why only one in twenty-five workers elected GDOL job training services. Workers leaving the manufacturing sector received training services at a 5.4 percent rate. The higher uptake of job training services for the former workers

Table 4.9. Counts of Workers Exiting Declining Industries and Job Training Services Received, 1999-2003

No LTU	JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI	TOTAL RECS	PERCENT TRAINED
All Declining Industries	15,663	542	7,359	8,619	552	1,346	289	1,603	1,478	378,355	4.1%
Manufacturing Industries	4,491	173	1,977	2,297	148	589	87	455	390	82,672	5.4%
Administration and Support	1,414	42	634	767	46	77	4	154	179	27,818	5.1%
Computer & Elect. Eq. Manuf.	350	44	112	154	4	20	0	80	16	6,530	5.4%
Electrical Equipment Manuf.	243	0	84	105	0	58	11	26	32	3,822	6.4%
Food and Beverage Retail	1,188	12	546	564	102	114	12	96	143	25,566	4.6%
General Mechandise Retail	320	18	178	212	8	20	8	32	24	7,270	4.4%
Hotels & Motels	829	10	384	528	32	32	0	128	96	18,196	4.6%
Machinery Manufacturing	196	0	84	104	4	28	4	44	9	5,288	3.7%
Textiles Manufacturing	1,619	171	1,069	896	22	216	58	284	225	28,516	5.7%
Transportation Eq. Manuf.	378	6	222	170	0	36	18	72	46	8,790	4.3%
LTU											
All Declining Industries	3,919	221	2,006	2,249	178	247	96	818	269	32,117	12.2%
Manufacturing Industries	1,215	56	600	554	96	59	35	297	50	8,273	14.7%
Administration and Support	177	7	109	126	0	11	0	39	12	3,143	5.6%
Computer & Elect. Eq. Manuf.	70	38	220	460	30	0	0	100	18	2,610	2.7%
Electrical Equipment Manuf.	84	3	39	32	0	8	5	5	16	467	17.9%
Food and Beverage Retail	276	23	132	144	0	45	0	38	27	2,796	9.9%
General Mechandise Retail	128	4	84	80	8	4	0	40	12	1,312	9.8%
Hotels & Motels	302	20	160	180	0	0	0	54	28	2,046	14.8%
Machinery Manufacturing	81	2	38	52	5	12	2	16	5	506	16.1%
Textiles Manufacturing	575	47	229	292	4	32	34	133	43	3,215	17.9%
Transportation Eq. Manuf.	131	0	51	93	0	9	0	16	12	1,398	9.4%

reflects the higher difficulty in finding new employment after leaving a steeply declining sector. The variation in the rate of services received was large: from a low of 3.7 percent in the Machinery Manufacturing industry to 6.4 percent in Electrical Equipment Manufacturing.

The Manufacturing super-sector accounted for 4,491, 45.3 percent of all workers trained. Within Manufacturing, the Textiles industries accounted for 36.0 percent of trainees. The largest numbers of workers transitioning from declining non-manufacturing industries to stable employment were in the Administration and Support Services, Food and Beverage Retail, Hotels and Motels, and the General Merchandise industries. This result was consistent with the shift-share analysis which found that the Administration and Support Services industry lost more net employment than any industry with Textiles and the Food and Beverage industry also losing large numbers of workers.

The employment transitions measured in Table 4.9 counted workers exiting a declining industry and regained stable employment, not including new workers entering the industry (no growth component), while the shift-share analysis was based on the smaller change in net employment (includes growth component) during the study period. The count of net employment loss in declining industries identified in the shift-share analysis and the count of worker transitions are thus consistent.

For some industries the count of workers receiving job training services was inadequate to guarantee statistical validity and, in some cases, limited the findings that could be inferred from the data. Particularly, the Core Services, Remedial Skills and Mentoring job training service tracks had few cases and, for some industries, such as Machinery Manufacturing and Computer and Electronic Product Manufacturing, the

number of cases in some training tracks was insufficient for statistical validity in the regression analyses. The number of training cases reflected both worker choice and the requirement of this research that workers have stable periods of employment both pre- and post-employment transition.

4.2.1.3. The LTU Worker Population

The number of LTU workers was smaller than the non-LTU population, 3,919, reflecting the fact that most workers found employment relatively quickly. The count of workers electing GDOL job training services was proportionately higher for LTU workers compared to non-LTU workers; 12.2 percent compared to only 4.1 percent. Similarly, the rate of participation in job training services for LTU workers leaving the manufacturing sector was 14.7 percent compared to 5.4 percent for non-LTU workers. The finding that LTU workers participated in job training at relatively high rates reflects their position in the job market and their perceived need for training to enhance their appeal to employers.

The count of job training participants was highest in the Administration and Support Services, Food and Beverage Retail, and Textiles industries. The Electrical Equipment and Transportation Equipment industries had the fewest number of participants. The participation rate in job training services was highest in Electrical Equipment Manufacturing (17.9 percent), the Textile industries (17.9 percent), Hotels and Motels (14.8 percent), and Machinery Manufacturing (16.1 percent). Relatively low participation rates were observed for Computer and Electronic Product Manufacturing (2.7 percent) and Administration and Support Services (5.6 percent).

Even though training rates were higher for the LTU population compared to the non-LTU population, the numbers of workers electing job training service was lower, reflecting their comparatively smaller numbers. Thus, statistical significance in the regression analyses was lower, limiting the findings that can be inferred from the data.

4.3. Statewide Analyses of the Impacts of GDOL Job Training Services

4.3.1. Analysis of Selected Declining Industries

4.3.1.1. Overview of the Statewide Analysis of Selected Declining Industries

Table 4.2 summarized the results of the 3-digit NAICS industry shift-share analysis and Table 4.8 listed the equivalent 4-digit SIC industries that are the focus of this section on the wage and job search times impacts of job training. The regression models presented in Chapter 3 Methodology were used to analyze worker-level microdata records for workers leaving declining industries which included the pre- and post- re-employment wage differences (denominated in dollars), the time required to find new stable employment (in quarters), the demographic control variables, and any job training experience. Results are presented for the promptly re-employed (one quarter or less, no LTU) and the long-term unemployed (2 quarters or longer, LTU). For this statewide analysis, no geographic variables such as the Urban-Rural Continuum (UR), or Workforce Investment Areas (WIA) were utilized. All worker microdata records were analyzed as a single data file.

Table 4.10 (wage dependent variable, non-LTU workers only), Table 4.11 (wage dependent variable, LTU workers only), Table 4.12 (time to re-employ dependent variable, no LTU workers), and Table 4.13 (time dependent variable, LTU workers only)

present both the non-demographically interacted regression results with control and job training service dummy variables and the demographically interacted (includes female, white, and age variables) regression results with control and job training service dummy variables for the declining industries in Table 4.8 combined into a single group. The eight job training services categories listed across the top of the tables are JTR (any job training service), COR (core services), INT (intensive services), REM (remedial/basic skills training), OJT (on-the-job training), MEN (mentoring services), JOB (extended job search services), and SKI (skills upgrade training) with the demographic interaction terms (female-white-age-young-old * job training service) along the left side of the table. The female and white variables are binary dummy variables equal to one if the condition was true. The regression models were run twice--once with the single JTR dummy variable and again with the other job training service dummy variables. Model coefficients for the interacted and non-interacted regression results are shown with t-statistics, overall F-statistic, R-square, and the number of training observations.

The focus of this research is on the job training explanatory variables and not the control variables which are included for the purpose of improving model performance and better isolating the job training effects from other factors. For this reason and clarity of presentation, the wage and time data tables presented in this analysis focus on the more important job training program explanatory variables rather than the control variables.

Table 4.10. Wage Effects Analysis: All Declining Industries, No Long-term Unemployment

		JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI
		Wage Difference Dependent Variable (Quarterly)								
Coeff.	Non-interacted	-172.11	-211.15	-232.33	-177.38	-106.04	166.90	-175.41	30.04	270.20
T-stat.		-1.71	-1.69	-1.85	-1.95	-0.57	0.48	-0.86	1.00	1.81
F-stat.		408.39	407.84	408.66	408.92	407.64	407.42	407.41	407.45	407.78
R-sqd.		0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Observ.		15,663	542	7,359	8,619	552	1,346	289	1,603	1,478
Coeff.	Female	230.52	-396.77	141.42	433.52	-444.23	65.75	154.76	-369.72	654.24
T-stat.		1.78	-0.51	1.66	2.05	-0.71	0.14	0.14	-0.91	1.83
F-stat.		350.17	349.63	350.28	350.89	349.55	349.21	349.21	349.39	349.69
R-sqd.		0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Observ.		8,294	283	3,944	4,464	298	715	151	867	749
Coeff.	White	132.35	112.28	-97.04	31.85	193.48	165.41	648.64	-12.02	223.56
T-stat.		0.92	0.18	-0.47	0.16	0.26	0.35	0.57	-0.03	0.34
F-stat.		350.05	349.57	350.43	350.53	349.45	349.21	349.24	349.27	349.53
R-sqd.		0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Observ.		7,429	276	3,441	4,166	263	646	143	759	737
Coeff.	Age	-42.47	-66.80	-44.26	-51.55	-46.85	-33.36	-66.95	-36.75	-42.70
T-stat.		-6.77	-2.06	-4.66	-5.64	-1.32	-1.43	-1.58	-2.07	-1.37
F-stat.		350.17	349.61	350.31	350.31	349.45	349.27	349.24	349.30	349.53
R-sqd.		0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Observ.		15,663	542	7,359	8,619	552	1,346	289	1,603	1,478
Coeff.	Young	-57.41	-55.17	-65.28	-44.83	-98.35	-82.87	-123.45	-70.52	-48.29
T-stat.		-4.75	-0.88	-3.79	-2.62	-2.06	-2.11	-1.75	-1.76	-0.59
F-stat.		149.01	148.10	149.09	148.85	148.46	148.10	147.98	148.12	147.95
R-sqd.		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Observ.		3,094	108	1,422	1,771	107	262	59	308	302
Coeff.	Old	-47.32	-120.53	-19.84	-51.80	176.28	-31.08	-153.90	-65.13	-105.02
T-stat.		-2.04	-1.11	-0.56	-1.69	0.63	-0.33	-0.78	-1.32	-1.20
F-stat.		27.85	27.99	27.85	28.20	27.84	27.79	27.82	27.83	28.05
R-sqd.		0.04	0.03	0.04	0.04	0.03	0.04	0.03	0.04	0.04
Observ.		1,933	71	968	1,055	72	167	36	197	186

Table 4.11. Wage Effects Analysis: All Declining Industries, Long-term Unemployment

		JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI
		Wage Difference Dependent Variable (Quarterly)								
Coeff.	Non-interacted	-5.60	-257.01	-602.72	-522.09	-356.23	41.72	121.73	-576.90	52.87
T-stat.		-0.04	-0.24	-1.78	-1.99	-0.02	1.66	1.08	-2.90	2.07
F-stat.		94.12	94.13	94.64	94.59	94.12	94.30	94.37	96.75	94.12
R-sqd.		0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.09	0.08
Observ.		3,919	221	2,006	2,249	178	247	96	818	269
Coeff.	Female	141.02	-335.12	100.56	75.77	431.70	1065.39	70.73	180.40	-675.05
T-stat.		0.54	-0.32	0.28	0.21	0.25	1.10	0.05	0.32	-0.54
F-stat.		80.93	80.76	81.29	81.21	80.67	80.88	80.89	82.96	80.79
R-sqd.		0.08	0.08	0.09	0.08	0.08	0.08	0.08	0.09	0.08
Observ.		2,090	118	1,112	1,243	100	140	52	439	141
Coeff.	White	129.18	-270.28	177.82	86.01	-236.31	645.75	-473.25	511.71	192.67
T-stat.		0.52	-0.27	0.49	0.25	-0.17	0.62	-0.16	0.93	0.16
F-stat.		81.11	80.68	81.38	81.18	80.67	81.00	80.89	83.23	80.68
R-sqd.		0.08	0.08	0.09	0.08	0.08	0.08	0.08	0.09	0.08
Observ.		1,723	100	966	1,028	79	112	45	372	127
Coeff.	Age	-49.55	-2.75	-48.82	-62.52	-47.31	7.49	-35.36	-44.12	-77.53
T-stat.		-4.01	-0.05	-2.34	-3.22	-0.65	0.16	-0.45	-1.95	-1.11
F-stat.		81.20	80.91	81.49	81.11	80.69	81.31	80.91	83.06	80.67
R-sqd.		0.08	0.08	0.09	0.08	0.08	0.08	0.08	0.09	0.08
Observ.		2,613	147	1,338	1,499	118	165	64	546	179
Coeff.	Young	-71.80	118.69	-54.25	-107.17	-90.04	54.82	66.73	-122.96	78.52
T-stat.		-2.41	0.94	-1.79	-2.41	-0.52	0.50	0.37	-1.99	0.41
F-stat.		20.56	20.56	21.36	20.81	20.15	20.54	20.33	22.21	20.24
R-sqd.		0.04	0.04	0.05	0.04	0.04	0.04	0.04	0.05	0.04
Observ.		315	17	167	182	14	19	8	70	21
Coeff.	Old	-59.62	47.56	-57.49	-80.56	-161.12	14.38	-41.51	16.04	-190.73
T-stat.		-1.87	0.36	-1.92	-2.15	-0.87	0.12	-0.22	0.22	-1.00
F-stat.		19.86	19.79	19.69	19.75	19.75	20.00	19.84	20.44	19.78
R-sqd.		0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Observ.		618	34	310	345	27	38	15	123	41

Table 4.12. Time Effects Analysis: All Declining Industries, No Long-term Unemployment

		JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI
		Time to Re-employ Dependent Variable (Quarters)								
Coeff.	Non-interacted	0.05	0.10	0.12	0.01	0.13	0.06	0.10	0.13	0.11
T-stat.		3.91	2.39	1.72	0.97	0.78	2.32	1.71	2.58	2.31
F-stat.		99.15	86.64	89.37	92.15	81.93	83.64	83.94	91.30	85.20
R-sqd.		0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Observ.		15,663	542	7,359	8,619	552	1,346	289	1,603	1,478
Coeff.	Female	-0.05	0.04	-0.05	-0.10	0.04	0.06	0.01	-0.01	-0.02
T-stat.		-3.40	-0.70	-3.02	-5.87	0.89	1.74	0.15	-0.40	-0.44
F-stat.		87.46	72.61	78.21	84.32	70.40	72.23	71.97	78.27	73.04
R-sqd.		0.09	0.08	0.09	0.09	0.08	0.08	0.08	0.08	0.08
Observ.		8,294	283	3,944	4,464	298	715	151	867	749
Coeff.	White	-0.01	-0.08	-0.02	-0.01	0.08	0.00	-0.03	0.06	-0.10
T-stat.		-0.64	-1.82	-1.03	-0.70	1.09	0.04	-0.31	1.83	-2.11
F-stat.		84.99	72.91	76.66	78.99	70.65	71.81	71.95	79.08	73.55
R-sqd.		0.09	0.08	0.09	0.09	0.08	0.09	0.08	0.08	0.08
Observ.		7,429	276	3,441	4,166	263	646	143	759	737
Coeff.	Age	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
T-stat.		8.71	10.82	4.70	4.60	1.96	4.08	3.89	1.60	0.54
F-stat.		89.16	72.58	78.69	80.30	70.51	73.45	73.78	78.29	73.24
R-sqd.		0.10	0.08	0.09	0.10	0.08	0.08	0.08	0.10	0.08
Observ.		15,663	542	7,359	8,619	552	1,346	289	1,603	1,478
Coeff.	Young	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.02
T-stat.		6.90	9.03	4.98	3.20	1.35	3.30	0.18	1.59	2.28
F-stat.		58.51	54.21	54.89	54.09	50.09	51.35	50.08	54.10	53.64
R-sqd.		0.06	0.05	0.05	0.05	0.04	0.05	0.04	0.05	0.05
Observ.		3,094	108	1,422	1,771	107	262	59	308	302
Coeff.	Old	0.00	-0.01	0.00	0.00	-0.04	0.02	0.02	0.00	0.00
T-stat.		-0.77	-3.52	-0.84	-1.45	-1.84	2.50	1.65	-0.78	0.02
F-stat.		13.73	4.78	7.79	9.61	4.44	5.84	6.89	7.57	4.24
R-sqd.		0.05	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.04
Observ.		1,933	71	968	1,055	72	167	36	197	186

Table 4.13. Time Effects Analysis: All Declining Industries, Long-term Unemployment

		JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI
		Time to Re-employ Dependent Variable (Quarters)								
Coeff.	**Non-interacted**	**0.38**	0.17	-0.02	**0.21**	-0.11	0.00	0.44	0.45	**0.40**
T-stat.		**2.17**	0.22	-0.21	**2.09**	-0.48	-0.03	1.00	0.41	**1.70**
F-stat.		18.95	2.91	11.49	12.93	3.53	3.19	2.79	5.63	2.94
R-sqd.		0.09	0.08	0.08	0.08	0.08	0.08	0.07	0.08	0.08
Observ.		3,919	221	2,006	2,249	178	247	96	818	269
Coeff.	**Female**	-0.01	**-0.41**	-0.13	0.00	-0.05	0.04	-0.12	-0.13	0.08
T-stat.		-0.16	**-1.70**	-1.14	-0.04	-0.10	0.12	-0.27	-0.72	0.21
F-stat.		16.24	2.75	10.08	11.08	3.03	2.73	2.41	4.90	2.53
R-sqd.		0.08	0.07	0.07	0.07	0.06	0.07	0.06	0.07	0.07
Observ.		2,090	118	1,112	1,243	100	140	52	439	141
Coeff.	**White**	**0.20**	**0.66**	**0.35**	**0.15**	0.05	-0.02	-1.26	**0.50**	-0.02
T-stat.		**2.03**	**1.85**	**1.90**	**1.64**	0.12	-0.05	-1.44	**1.97**	-0.07
F-stat.		17.91	3.28	12.07	11.67	3.03	2.73	2.65	6.30	2.52
R-sqd.		0.08	0.06	0.07	0.07	0.05	0.07	0.06	0.07	0.07
Observ.		1,723	100	966	1,028	79	112	45	372	127
Coeff.	**Age**	0.00	**0.03**	0.01	0.00	0.00	0.00	-0.02	0.01	-0.01
T-stat.		-0.48	**1.88**	1.25	-0.33	0.12	-0.33	-0.92	1.13	-0.30
F-stat.		16.27	2.91	10.00	11.10	3.02	2.75	2.54	5.01	2.53
R-sqd.		0.09	0.08	0.08	0.08	0.08	0.08	0.07	0.08	0.08
Observ.		3,919	221	2,006	2,249	178	247	96	818	269
Coeff.	**Young**	0.00	0.07	**0.03**	-0.01	0.05	-0.05	-0.03	0.00	-0.06
T-stat.		-0.21	1.20	**1.65**	0.87	0.78	-1.27	-0.48	0.09	-0.85
F-stat.		8.05	2.36	4.99	6.59	2.54	2.33	2.34	2.52	2.41
R-sqd.		0.05	0.04	0.05	0.05	0.04	0.04	0.04	0.04	0.04
Observ.		315	17	167	182	14	19	8	70	21
Coeff.	**Old**	-0.01	-0.01	0.00	-0.01	0.02	-0.04	0.00	0.00	-0.06
T-stat.		-0.98	-0.23	-0.27	-0.75	0.46	-1.03	-0.04	0.24	1.17
F-stat.		13.30	2.15	8.64	7.57	1.72	2.22	1.24	4.78	1.57
R-sqd.		0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Observ.		618	34	310	345	27	38	15	123	41

The null hypothesis for the ineffectiveness of GDOL job training programs to raise worker wages when rehired, H_0: $\beta \leq 0$, could be rejected for the alternate hypothesis H_A: $\beta > 0$, consistent with positive wage effects from job training. The null hypothesis of the ineffectiveness of GDOL job training programs to reduce the time required to find new stable work, H_0: $\beta \geq 0$, could be rejected for the alternate hypothesis H_A: $\beta < 0$, consistent with positive time effects from job training. The determination of statistical significance of the wage dependent variable and the time dependent variable regressions utilized a 2-tailed t-test to provide a conservative estimate of the statistical significance. Rejection of the null hypothesis at a selected level of significance was an indication that the explanatory variable in question did have a positive effect on the dependent variable. As is evident from the tables, many relationships between wage impacts and specific job training tracks were found to be statistically insignificant and some were negative, consistent with many similar findings in the literature (see Section 4.3.1.6 for a discussion of the consistency of these results with previous research).

4.3.1.1.1. Non-LTU Workers

Tables 4.10 and 4.12 show that 15,663 non-LTU participants received job training services from a total universe of 378,355 non-LTU workers records (4.1 percent). The number of observations reported in these tables reflected the number of training experiences of workers regaining stable employment in a new industry and not the total worker population leaving declining industries. As noted in the Chapter 3 Methodology, this universe was restricted to Georgia's workforce as verified by GDOL wage and job training program, unemployment insurance, and job training program records.

The number of training observations for non-LTU workers leaving Georgia's declining industries varied from between 8,619 and 7,359 for Occupational Skills and Intensive Services, respectively, to 289 and 552 for Mentoring and Remedial Skills job service programs. The number of training observations for all training services was potentially sufficient to ensure statistical significance for the regression results.

4.3.1.1.2. LTU Workers

Tables 4.11 and 4.13 show that 3,919 LTU participants received job training services from a total universe of 32,117 LTU workers (12.2 percent) leaving the identified declining industries. These data indicate that four times as many LTU job training participants elect job training services compared to non-LTU workers. As might be expected, workers experiencing long-term unemployment are more likely to use job training services. As with the non-LTU data, the number of observations reported in these tables reflected the number of training experiences and not the total population.

The number of training observations for LTU workers leaving declining industries is less than for the non-LTU populations, reflecting the population size of the two groups. Occupations Skills training and Intensive Services had 2,249 and 2,006 observations, respectively, while Mentoring and Remedial Skills training had many fewer participants; 96 and 178, respectively. Even though the number of LTU observations was much smaller than the count of non-LTU observations, regression results were still potentially statistically significant.

4.3.1.2. Wage Effects Attributable to Job Training

Figure 4.1 is based on the methodology presented in Figure 3.4 which graphically depicts inter-industry employment transitions from declining industries to the industries

which receive the workers. Figure 4.3 illustrates that workers transitioning from the identified declining sectors found stable employment in a variety of industries. The Poultry Slaughtering, Telephone Communications, Computers and Peripheral Wholesaling, Textiles, Grocery and Department stores, Hotels, Business Services, and Help Supply services absorbed the largest number of transitioning workers. For the industries shown, it is evident from the slopes of the arrows connecting pre- and post-transition wages that more workers raised their wages than lost wages.

The average wage for workers leaving declining industries was $6,792 quarterly, or $27,168 annually. The average quarterly wage for the receiving industries ranged from $17,257 in Computer and Peripherals Wholesaling to $3,516 in the Grocery Stores industry. Of the ten receiving industries only two industries —Telephone Communications and Computers and Peripherals Wholesaling—had higher average wages than the average declining industry wage. Of particular interest is the fact that the workers transitioning to these two industries were located in the upper range of the declining industries group.

For workers in Georgia's declining industries as a whole, wages varied (at the 10 and 90 percent points) from $2,350 to $15,900 quarterly. Some workers improved their wage levels; other lost wages in the transition. In general, workers making above average wages pre-transition were more likely to find their wage levels improve while those in the bottom half of the wage distribution often experienced lowered wages. Worker-level occupational data linked to wage and industry microdata was not available for this research but it seems likely that the workers transitioning to the Computers and Peripherals industry ($11,913 average quarterly wage) and Telephone Communications

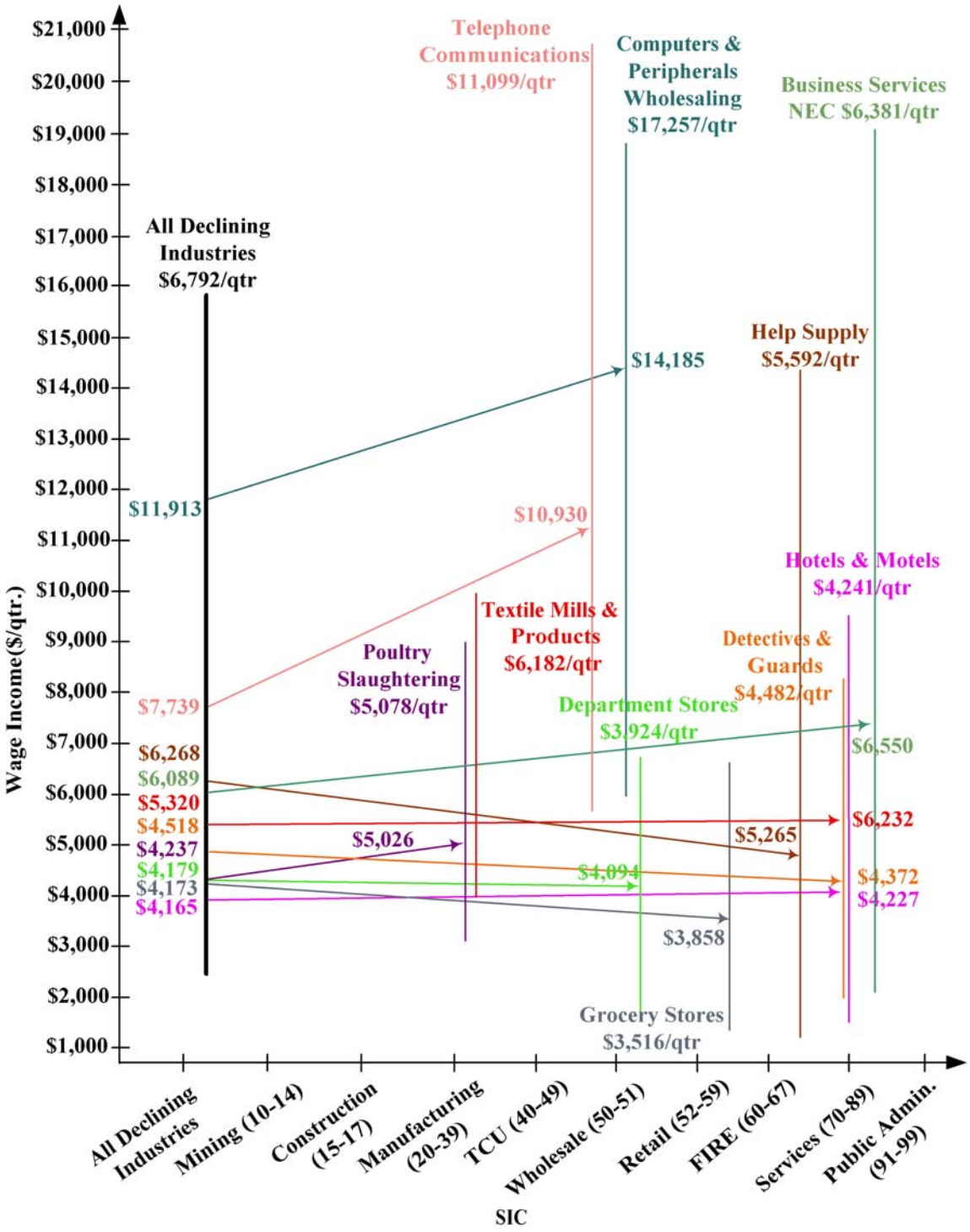

Figure 4.1. Inter-Sectoral Employment Transitions from Selected Declining Industries, Industry Wage Ranges and Averages & Average Transitional Wage Levels

industry ($11,099 average wage) were employed in higher-level technical functions while employed in a declining industry.

Workers moving to the Computer and Peripherals Wholesaling sector improved their quarterly wages by $2,272, a 19.1 percent increase. Similarly, workers finding work in the Telephone Communications, Business Services, Poultry Slaughtering, and the Hotels and Motels industries increased quarterly wages by 41.2, 7.6, 18.6, and 1.5 percent respectively. In contrast, workers leaving declining industries for the Help Supply Services sector lost $1,003 quarterly, only 84.0 percent of their previous wages level. Likewise, workers employed by the Detectives and Guards, Grocery Stores, and the Department Stores industries lost 3.2, 7.5, and 2.0 percent respectively. Workers in the Help Supply industry evidenced the steepest decline in age levels, from $6,268 quarterly to $5,592 quarterly, a decline of 10.8 percent.

Summarizing Figure 4.1, it is clear that the industries drawing the largest numbers of transitioning workers originated from the lower half of the declining industry wage distribution. Many workers in this bottom range found new work that compensated them about as well as their pre-transition industries. The most important question addressed by this research is whether GDOL job training services, used by a minority of these transitioning workers, had positive effects on post-transition wage levels. That question is addressed in the next section.

4.3.1.2.1. Non-LTU Workers

For non-LTU workers (Table 4.10) receiving any Job Training (JTR), the non-interacted regression coefficient was statistically significant at the 10 percent level (t = -1.71) and corresponded to an estimated loss of $172 per quarter for trained versus non-

trained workers. While this relatively low level is below the preferred social science standard for significance (5 percent), it does signify a definite relationship between the independent and dependent variables. This negative wage impact indicates that job training services were ineffective on average for boosting trainee wages over those of non-trainees. Explanations for this finding focus on the personal characteristics of the self-selected trainees rather than the quality of training services received. This overall result for all job training services in the aggregate indicates that such programs are ineffective, both economically and statistically.

The Core (-$211), Intensive (-$232), and Occupational Skills (-$177) training service categories evidenced negative wage effects and were significant at least the 90 percent level. The Core and Intensive service categories are associated with the walk-in services provided by each of the GDOL One-stop Centers and involve initial job search assistance, résumé preparation, and interviewing and "life" skills instruction. Importantly, the Skills Upgrade variable was positive ($270) and significant at the 10 percent level. The positive impact of Skills Upgrade training was especially important because that category most directly involves the traditional areas of job training focused on factory and assembly line skills rather than the Core and Intensive services that focus on readying a participant for the workplace. The fact that the self-selected Skills Upgrade participants experienced positive wage impacts from job training suggests that personal characteristics do not entirely explain why job training was associated with negative wage impacts, though it is possible that that those trainees are systematically different from the average GDOL job training services participant.

The remaining categories for the demographically interacted variable regression analysis involved dummy variables for female and white racial identity. For non-LTU workers, the receipt of any job training service (JTR) was determined to be positive for female trainees ($231, significant at the 90 percent level) compared to female non-trainees. As noted previously, the non-interacted coefficient for JTR was -$172 for males and females combined but unlike for males, the net wage effect for females receiving training services was significantly positive. This finding is not only statistically significant but also economically significant to females because the regression coefficients indicate that job training had a positive benefit for females, almost a thousand dollars annually.

The Occupational Skills training impact for females compared to female non-trainees was estimated to be $434 quarterly. This wage effect was large and significant (t = 2.05, at 5 percent). Occupational Training Skills training, such as secretarial and office instruction, has been traditionally associated with females and appears to benefit females more than males. The Skills Upgrade training wage impact for females was $654, $384 more than males and females combined. For all job training service categories with statistical significance, the results for females were positive, indicative of a broad finding of beneficial wage impacts for females.

For non-LTU workers, white racial identity did not appear to be a statistically significant factor in determining wage impacts in any of the job training service categories. All t-values were less than unity. Though statistically insignificant, most of the training service coefficients were positive.

For non-LTU workers, as age increased one year, the wage impacts associated with job training decreased wages by an estimated average of $42 quarterly compared to non-trainees. Core Services, Mentoring, and Occupational Skills training had relatively higher adverse wage effects with age and OJT and Extended Job Search had lower wage impacts. This effect indicates that, on average, as trainees became older they experienced increasing wage differentials compared to non-trainees. On average, job trainees never catch up with respect to wages with their non-trainee counterparts. The average negative wage impact for young workers (maximum age of 24 years) and older workers (minimum age 54) was $57 and $47, respectively, indicating that the rate of negative wage growth was higher for younger and older trainees than all workers taken as a group. Given that the average wage impact for all workers, including the middle-aged, was lower than either the younger or older age groups, the wage difference-age curve had at least two inflection points.

4.3.1.2.2 LTU Workers

Table 4.11 summarizes the regression results for wage impacts associated with receiving job training services for workers exiting declining industries and experiencing long-term unemployment. The average non-interacted effect of job training services for the long-term unemployed trainees was near zero ($5.60 per quarter) and statistically insignificant (t = -0.04). Unlike the non-LTU trainees who had negative wage impacts associated with job training services, LTU trainees showed no statistically significant wage benefits over non-trainees for workers leaving declining industries. No conclusions regarding wage impacts on LTU trainees can be inferred from this result.

As for non-LTU trainees, Skills Upgrade participants experienced positive wage impacts compared to non-trainees, $52 quarterly, significant at t = 2.07. The economic significance was small, $208 annually, compared to $1,081 for the non-LTU job training participants. Modest positive wage effects were associated with OJT and the effects was of marginal significance. Intensive Services, Occupational Skills, and Extended Job Search had large significant negative wage effects for trainees, -$603, -$522, and -$576, respectively. GDOL's information services appeared to be even less beneficial for LTU participants than the non-LTU participants. For the LTU trainees, no significant wage effects were observed for female or white racial identity.

Similar to the non-LTU trainees, negative age coefficients were observed on average (-$50 per quarter for each year of age) for trainees compared to non-trainees, most specifically for Intensive Services, Occupational Skills training, and Extended Job search. Compared to the non-LTU trainees, the average adverse impact of another year of age for an LTU trainee was $7 per quarter. Age was not found to have a significant impact on the other training categories. As with the non-LTU population, the negative wage effects associated with job training for the LTU population was larger than for all workers as a group.

4.3.1.3. Effects of Job Training On the Duration of Unemployment

4.3.1.3.1 Non-LTU Workers

Table 4.12 presents the regression results for the effects associated with job training services on the duration of unemployment for workers not experiencing long-term unemployment. Although job training requires a time investment on the part of trainees, ideally the cost was outweighed by increased desirability once on the job

market. On average, for trainees quickly re-employed after leaving a declining industry, job training was associated with about five additional days to the time required to become re-employed (coefficient=0.05) compared to non-trainees. In part, this may be due to the time required to receive most job training services, especially those requiring a lengthy program of study such as Skills Upgrade training. The longest additional time required for trainees to find work, 11.8 days, was understandably longer for those receiving Extended Job Search services. The shortest time, 5.6 days was for OJT trainees which, for some, may reflect continued employment with the same firm supplying the training.

Overall, trained females obtained new employment quicker than untrained females, an average of 4.8 days. For Intensive services and Occupational Skills training, females found new work faster than female non-trainees, 4.6 days and 9.7 days, respectively. For OJT, trained females took longer to find work; about 5.5 days.

White racial identity did not appear to be a factor in job search time in most categories. The exceptions were for receipt of Core services (compared to white non-trainees, trained whites took 7.8 days less time to find work) while white Skills Upgrade trainees found work 9.5 days faster). White trainees using Extended Job Search Services took longer to find a job than non-trainees; about 5.5 days.

Increasing age was positively correlated with a lengthier job search for adults, though the penalty was very small, varying from less than a day per year of age for Core services to 1.2 days per year for Mentoring. For both younger and older training participants, the age impacts on the time required to find new employment closely mirrored that of the total worker population leaving declining industries; often

statistically significant but very small in magnitude, less than two days in most categories.

4.3.1.3.2. LTU Workers

The effects of utilizing job training services on the time required to find new employment for workers experiencing long-term unemployment are shown in Table 4.13. By definition, the LTU population experienced longer job search times than non-LTU workers so the question addressed here is whether the receipt of job training services shortened the time required by LTU trainees to find new work compared to similarly situated non-trainees.

Overall, for LTU trainees, the additional time required to find work compared to non-trainees was 34.7 days. Non-LTU trainees found work thirty days sooner than LTU trainees. It is clear from the results that LTU job training program participants take longer to find work than LTU non-participants, either because of the time required for the training or other factors such as the personal characteristics of the workers electing job training.

Despite the relatively high level of non-interacted regression significance for job training services, only two individual training categories were statistically significant. For Occupational Skills training, trainees needed 19.2 days more time to find employment compared to non-trainees. For Skills Upgrade training, participants delayed re-employment by 36.5 days, a likely reflection of the additional time required for this type of training.

Only one training category was determined to have a significant effect on the time for re-employment for female trainees versus non-trainees. For female trainees, receipt

of Core services subtracted 37.4 days from job search time compared to non-trainees. Though of low significance, this finding shows that GDOL informational services can be an effective method of reconnecting some workers to the labor force.

The LTU white trainees experienced significantly longer job search times compared to white trainees. This might be explained by a higher reservation wage for whites, especially if they earned more than blacks prior to their sectoral transition. Overall, white trainees required 18.3 more days than white non-trainees to find work. White Core Services training recipients needed 60.2 days more time to find work compared to non-trainees, those receiving Intensive services required 31.9 more days, and those receiving Extended Job Search services required 45.6 more days to secure employment. Unlike for the white non-LTU participants, Skills Upgrade training had a statistically insignificant effect on the time-to-reemploy. Overall, job search times did not show a significant variation with age. Only Core Services recipients evidenced a small but significant increased effect on the time required to find new work; 2.7 days per year of age.

4.3.1.4. Job Training Service Cost-Effectiveness Analysis

Cost effectiveness analysis (CEA) was the primary means by which the central research question of this research—Which GDOL Training Programs are most effective at alleviating structural unemployment, and why?--was answered. Among other findings, the Cost Effectiveness analysis will demonstrate that while Skills Upgrade training yielded significantly higher wage impacts for trainees, for most groups the higher program costs made the relatively less costly Intensive services more efficient for provision of services to a large segments of the general worker population.

Comparisons of cost-effectiveness values are meaningful only when the costs and benefits being compared are adjusted to the same time period. The wage effects of job training were assumed to be distributed over a period of five years extending beyond completion of the course of training. Wage impacts that occur in the future were appropriately discounted to their "present value" (Equation. 3.2). The annual discount rate adjusted future wage benefits to account for inflation. The choice of discount rate was somewhat arbitrary, although a plausible range is between three and seven percent (Barnett, 1996b). Because job training services were usually rendered with a period of a single year, usually 30 to 40 weeks, training costs were not time-adjusted. The positive wage effects from job training services were assumed to exist for a period of five years after which intervening factors were assumed to rapidly diminish the effects of training (see Chapter 3). Cost effectiveness ratios were calculated for positive job training service impacts; i.e. when a wage impact was positive or job search time was reduced.

As noted, program cost per participant data were only available for Intensive services, Occupational Skills training, and Skills Upgrade training. For Gwinnett, Rockdale, and Douglas Counties, the average cost per participant for Intensive services was $84.82 and was used here as indicative of the state as a whole[15]. The Atlanta Regional WIA reported that the average cost for Occupational Skills training was $3,250 for that WIA.

The training costs for Skills Upgrade participant training costs were available on-line through the GDOL Eligible Provider list. For this research, an average of seven

[15] The Cherokee County cost, the minimum for which data was available, was only $9.20 less.

typical training programs[16] (Technical Certificate credential) offered by different service providers in the Atlanta Regional WIA was used for the cost per participant data. The mean cost per Skills Upgrade training participant used in this analysis was $1,735.

4.3.1.4.1. Non-LTU Workers

Table 4.14 presents the results of using Equation 3.3 to identify the training service with the most cost effective impact on wages, indicated here by the smallest cost-effective ratio (CER). A CER less than unity suggests a net beneficial public investment in training and provides a metric for evaluating the relative merit of alternative training service investments. For non-LTU job training participants, only Skills Upgrade training had a positive impact on worker wages. The Intensive services and Occupational Skills training categories, for which participant cost data were available, showed negative wage effects and so were not analyzed for cost-effectiveness. In contrast, Skills Upgrade training evidenced a $270 per quarter ($4,676 over a discounted five year period) positive impact on trainee wages compared to non-trainees. So, for Skills Upgrade training, a public investment of $0.37 in training costs resulted in a wage gain of $1 for trainees that experienced less than two quarters of unemployment when leaving a declining industry. The positive impact of Skills Upgrade training is important because that program most directly involves the traditional areas of job training focused on factory and assembly line skills rather than the Core and Intensive Services that center on readying a participant for the workplace.

[16] The programs were: Electrical Technician, Air Conditioning Service Maintenance Technician, Computer Hardware Specialist, Computer Technician, Engine Performance Technician, HVAC Technician, and Refrigeration Technician.

Table 4.14. Cost Effectiveness Analysis, Wage Effects

Trainee Population	Demographic Factor	Job Training Service	Service Cost ($)	Wage Effect ($)	CER
Non-LTU					
	Non-Interacted	Skills Upgrade	$1,735	$4,679	0.37
	Female	Intensive Services	$84	$2,449	0.03
		Occupational Skills	$3,250	$7,508	0.43
		Skills Upgrade	$1,735	$11,330	0.15
LTU					
	Non-Interacted	Skills Upgrade	$1,735	$916	1.89

For non-LTU females trainees, all three of the job training services for which data was available had significant positive wage impacts. While Skills Upgrade training had the largest effects on female trainee wages, the gains came at a relatively high participant cost yielding $0.15 for a dollar investment. For each $0.03 invested in Intensive services for females, a dollar increase in wages resulted. The CE analysis indicated that Intensive services were actually more efficient in terms of delivering benefits to a broad client base. The least efficient investment was Occupations Skill training, which resulted in a return of $1 for each $0.43 invested.

Table 4.15 presents the results of calculating cost-effectiveness ratios based on the cost of public investment for the time saved in job search. The time CER provides an indication of the utility of investment in job training services in terms of program funds spent to reduce the time spent in job search. No significant beneficial impacts from job training services on the length of job search were found for non-LTU training participants in the non-interacted regression analysis.

Table 4.15. Cost Effectiveness Analysis, Time to Re-employment Effects

Trainee Population	Demographic Factor	Job Training Service	Service Cost ($)	Time Effect (Days)	CER
Non-LTU					
	Female	Intensive Services	$84	4.6	$18
		Occupational Skills	$3,250	9.1	$356
	White	Skills Upgrade	$1,735	9.0	$192

Beneficial time-to-reemploy impacts were observed for non-LTU female trainees using Intensive services and Occupational Skills training. Female users of Intensive services found work 4.6 days more quickly than males while those receiving Occupational Skills training found work 9.1 days more faster. The substantially higher cost of Occupational Skills training ($3,250) dominated the CER calculation even though the time benefits of Intensive services were only half as large.

The impact on reduced job search time for female participants for Intensive services was short but, because of the small investment, amounted to a service cost of $18 for each day of job search saved. Though modest, this saving is still in excess of the wages earned by most workers in a day. The investment cost for Occupational Skills training averaged $356 a day saved, which did not reflect a worthwhile training service investment. However, the time saved in job search was not the sole criterion by which investment should be measured; the net discounted wage effects are more important.

Improvements in the length of job search for white non-LTU trainees were found for Core services but only Skills Upgrade training had participant cost data available. For an investment of $1,735, the job search time for white trainees compared to white non-trainees was reduced by nine days at a program cost of $192 per day, not an efficient

public outcome. But again, the discounted wage effects are more important in justifying the public investment in training.

4.3.1.4.2. LTU Workers

For the training programs with available participant cost data, Intensive services and Occupational Skills training evidenced significant negative effects on wages for LTU trainees compared to LTU non-trainees. However, OJT and Skills Upgrade training had positive effects, $42 and $52 per quarter, respectively but program cost data was available for the latter. Table 4.14 shows that for every dollar spent on training, only $0.53 in wage impacts were observed over the five-year recovery horizon. If the CER calculation accumulated wage impacts for a period of ten years, the resulting impact on wages was still only $1,633, an insufficient amount to recoup the public investment in training. No significant differential wage impacts were found for female or white LTU job training service participants.

Except for Core services, no training category for LTU workers reflected a reduction in job search time. Core job services for LTU workers evidenced beneficial effects for females, 77 days saved in job search, but because no program cost data was available, no cost effectiveness calculation was possible. A very important finding of this research was that LTU workers, those often affected by the structural decline of Georgia industries and most in need of GDOL job training services, were not effectively served by the workforce development system.

4.3.1.5. Statistical Considerations

4.3.1.5.1. Non-LTU Workers

Table 4.10 shows a value of 0.08 for the non-interacted R-squared goodness-of-fit measure for the wage dependent variable. Similarly, Table 4.12 shows a value of 0.10 for the non-interacted R-squared goodness-of-fit measure for the time dependent variable. As Wooldridge (2000) notes, "…in the social sciences, low-R-squares in regression equations are not uncommon…" and that a good estimate of the *ceteris paribus* relationship … does not depend directly on the size of R-squared." The key is whether the percentage of explained variance is statistically significant as evidenced by sufficiently high values for overall-F and the t-statistics for the explanatory variables. Wooldridge writes, a "small R–squared reflects what we already expect in the social sciences: that it is very difficult to predict individual behavior."

The R-square values for the young and old non-interacted non-LTU wage dependent variable categories were smaller, 0.05 and 0.04, possibly reflecting a smaller number of observations from the disaggregated age groups or more variability in the data within these groups. The R-square values for the young and older non-LTU time dependent variable categories were slightly larger than for the wage dependent variable, 0.06 and 0.05 respectively. In all cases in Tables 4.10 and 4.12, the values of the F-statistics are large, in part the result of a substantial number of training observations. The high F-statistics are indicative of the validity of inferring results from regression coefficients with small t-statistics. The relatively lower t-values for the wage compared to the time dependent variable probably reflects more variability in the wage data compared to the time data.

For the non-interacted wage regression model for non-LTU workers, the control variables explained most of observed variance. For the wage model, the standardized beta

coefficients[17] showed that the age (-0.158), female (0.013), and white (0.017) control variables were more powerful explanatory factors than the job training variable (JTR) (-0.008). This stems from the high variability of the wage data, a reflection of the chaotic employment history in evidence for many workers. This pattern was repeated for the demographically interacted regression results as well. For the non-interacted time model for non-LTU workers, the standardized beta coefficients show that age (0.070), female (-.006), and white (-0.017) control variables were less powerful explanatory factors than the job training variable (0.033).

4.3.1.5.2. LTU Workers

The R-square values for the LTU worker regression equations presented in Table 4.11 and Table 4.13 for the wage and time dependent variables were slightly lower than those for the non-LTU worker population, in part because of the smaller number of training observations. The non-interacted R-square values for the LTU wage model were 0.08 and 0.09 for the LTU time model.

The R-square values for the young and old LTU wage dependent variable categories were relatively smaller than the non-LTU values, both 0.04, again resulting from a smaller number of observations from the disaggregated age groups. The R-squares for the young and old LTU time dependent variable categories were also smaller, 0.05 and 0.04, respectively. For the interacted dependent variables, the values for R-square were slightly lower for both the non-interacted wage and time models.

For the wage and time non-interacted regression results for LTU workers, the control variables again explained a significant amount of the observed variance. For the

[17] Standardized beta coefficients are the regression coefficients when all variables are expressed in standardized (z-score) from the SPSS Version 10.1 documentation.

non-interacted LTU wage model, the standardized beta coefficients indicated that the control variables age (-0.187), female (0.057), and white (-0.033) were more powerful explanatory factors than job training (JTR) (-0.012). For the non-interacted LTU time model, the standardized beta coefficients showed that the control variables age (0.002) female (-0.002), and white (-0.018) were less powerful explanatory factors than the job training variable (JTR) (0.087).

These results for the LTU workers population parallel those of the non-LTU population where the job training explanatory variables were more significant predictors than the control variables for the time effects model and less significant predictors of the wage effects. The wage and time impacts regression results for declining industries were typical of the other the industries analyzed in this research, reflecting more variability in the wage data compared to the duration-of-unemployment data.

The focus of this research is on the job training explanatory variables and not the control variables which are included for the purpose of improving model performance and better isolating the job training effects from other factors. For this reason and brevity and clarity of presentation, the wage and time data tables presented in this analysis focus on the more important job training program explanatory variables rather than the control variables.

4.3.1.6. Consistency With Previous Research

The non-interacted wage regressions presented below for both the non-LTU and LTU worker populations revealed that most relationships between wage impacts and specific job training tracts were statistically insignificant and some were negative, consistent with many similar findings in the literature.

This research found negative wage effects for many demographic groups and training programs, suggestive of adverse effects from exposure to job training programs. This finding is not without precedent in the literature. Negative wage effects are consistent with results found by Orr and Bloom, et al, for certain sub-groups of the worker population in their major survey of the National JTPA program (1995). By far the most comprehensive and rigorous of any study of job training programs, the National JTPA evaluation followed 20,000 JTPA applicants over a period of 2½ years. (In contrast to the JTPA study, the WIA program, with its focus on immediate employment, not skills-based job training, has not been similarly evaluated.) Participants were randomly assigned to control or experimental groups. Multiple regression analysis compared the impacts of JTPA graduates to those of similar workers who did not participate in the training and found no significant impact (significance level $p = .10$, two-tailed t-test) on total earnings for most groups including youth. There were no statistically significant impacts on long-term earnings of participants compared with the control group for any of the program's three service strategies. Lafer (2002) argued that even the minor positive impacts for adults may have not been due to the impact of job training skills but rather job placement services.

Bloom and Orr found a variety of contradictory results, among them that the control group wage increases sometimes exceeded those of the treatment trained group. One group, black males, experienced reduced wages by as much as 22 percent. As Bloom and Orr noted, "…one cannot control directly for characteristics that affect labor market outcomes but that cannot be measured fully, such as motivation" and that "although a wide range of statistical matching and modeling procedures have been used

to address the problem (of selection bias), no acceptable solution has been found." Goldhaber and other workers in field of educational impacts analysis recognize the existence of unobservable effects but underscore the difficulty of including such factors in analyses (Goldhaber and Brewer 1996). Educational processes are often treated in the literature as emerging from a "black box", in part, because measurement is so difficult and partly because the choice of variables in a multivariate analysis is arbitrary.

After the National JTPA study delivered such disappointing results, the GAO conducted another study of the JTPA program and found that, "…we found no significant effect of JTPA on earnings or employment rates after five years" (US GAO 1996). Like the National JTPA study, study participants were randomly selected to receive or not receive training services[18]. The lack of income impacts for all participants, even for the women who measured a positive impact for education, suggests that the JTPA, and by implication the WIA, are of limited effectiveness. Similarly, Barnow's comprehensive review of studies of the JTPA's predecessor, the Comprehensive Employment Training Act (CETA) program, found estimates that ranged from small earnings gains to large earnings losses, depending on the study"(1987).

The goal of this research was to measure the impact of job training on a participant's wage at re-hire and the time required to find new employment. But the decision to hire an employee is not based solely on performance in job training programs but, instead, is an assessment based on many personal characteristics. Job training is one of many factors in a difficult-to-separate bundle of personal characteristics which are judged by each hirer. Individuals selecting job training often have personal barriers to

[18] The control non-training group was given a job training option after their participation in the study.

employment--low education levels, scant work history, motivational or problems with drug and alcohol abuse--and therefore might be expected to benefit least from any training program; the variety of these characteristics is so great, and unfortunately unmeasurable (Grubb 1995).

The research findings demonstrate that for workers exiting declining industries some GDOL job training services were effective in raising the wages of some trainees, particularly females, in some tracks—Intensive Services, Occupational Skills training, Skills Upgrade training, specifically—but other tracks—Core Services, On-the-Job training, Mentoring, Remedial Skills training, and Extended Job Search—were often ineffective.

4.3.1.7. Reconciliation of Research Hypotheses

Research Hypothesis 1, presented in Section 3.2, states that "For structurally unemployed workers, GDOL training programs are ineffective at raising wages when re-hired into stable employment." As noted earlier in this chapter, the average impact on wages was negative (-$172 per quarter for non-LTU workers and statistically insignificant for LTU trainees) so this wage null hypothesis could not be rejected for the average trainee leaving declining industries. However, Skills Upgrade trainees evidenced positive wage impacts which did lead to rejection of the null hypothesis. Thus, while on average the wage null hypothesis was rejected, this was not so for all cases.

For Research Hypothesis 2, also presented in Section 3.2, states that "For structurally unemployed workers, GDOL training programs are ineffective at reducing the time required to find new stable work." This hypothesis could not be rejected for the

average non-LTU or LTU trainee leaving a declining industry or those receiving most training services (some time impacts were insignificant for some training services).

Research Hypothesis 3, which stated that GDOL job training services were less beneficial to females compared to males, was rejected for wage effects on non-LTU trainees in almost all training categories including Intensive Services, Occupational Skills training, and Skills Upgrade training (no significant wage effects were observed for the LTU trainees). The time effects for female trainees compared to male trainees were also negative leading to a rejection of the null hypothesis of training being less beneficial to females in most cases. Similarly, Research Hypothesis 4, which stated that job training was less beneficial for white trainees compared to non-white trainees, could not be rejected because the wage effects were insignificant for non-LTU and LTU trainees for workers leaving declining industries, not permitting any conclusion regarding the hypothesis to be drawn. Research Hypothesis 5, which stated that job training was less beneficial for adult trainees than younger trainees, was consistently rejected reflecting the finding that wage differentials for adults were smaller than those for younger (or older) trainees compared to non-trainees.

Overall, the results of this research show that this study's set of general null hypotheses of no or negative benefits for job training failed to be rejected for some job training programs and for some trainee populations but not for others. This pattern of a failure to reject the null for some training programs and demographic groups and not others was observed for both non-LTU and LTU trainees leaving declining industries as a group and for the other industries subsequently analyzed in the next three sections.

4.3.2 Analysis of the Selected Declining Manufacturing Industries

4.3.2.1. Overview of the Statewide Geographic Analysis

The shift-share analysis earlier this chapter identified the Manufacturing super-sector as a major source of employment loss in the state of Georgia. During the 1999-2003 study period manufacturing declined an estimated 79,595 net jobs in the state (Table 4.2). Table 4.8 identified the manufacturing sub-sectors that were in the steepest decline:

- Textile Mills (SIC 2211, 2273)
- Textile Mill Products (SIC 2281)
- Machinery Manufacturing (SIC 3523-3599)
- Transportation Equipment Manufacturing (SIC 3711-3799)
- Computer and Electronic Product Manufacturing (SIC 3570-3579, others)
- Electrical Equipment Manufacturing (SIC 3580, others).

The present section analyzes as a single group the state-level wage and duration-of-unemployment impacts from job training services on workers leaving these declining manufacturing industries. As with the analysis for declining industries, the manufacturing industry analysis presents results for the promptly re-employed (one quarter or less, no LTU) and the long-term unemployed (2 quarters or longer, LTU) with the latter being more closely associated with structural unemployment. Long-term unemployment, and structural unemployment, is a particular concern for the Georgia, and national, economy.

The Manufacturing sector has long been an important source of stable employment in Georgia, and has paid relatively high wages to a less well educated but skilled worker population. The UR and WIA shift-share analyses have revealed manufacturing unemployment to be geographically widespread but particularly acute in the rural areas of the state. The shift-share analyses have shown that the rural economies were often more dependent on the manufacturing sector than the more diversifies urban economies. The loss of employment in manufacturing presents a challenge to the GDOL workforce development system in terms of the numbers of unemployed workers, their dispersed geographic distribution, and their likely expectations of re-employment at comparable wage levels.

Tables 4.16 (wage dependent variable, no LTU), 4.17 (wage dependent variable, LTU), 4.18 (duration-of-unemployment dependent variable (time), no LTU), and 4.19 (time dependent variable, no LTU) present the non-interacted and demographically interacted regression results for workers exiting the manufacturing industries cited above. As before, nine job training services categories were analyzed and are presented in the tables with the regression statistics.

4.3.2.1.1. Non-LTU Workers

Tables 4.16 (wage dependent variable) and 4.18 (time dependent variable) show that 4,491 non-LTU participants received job training services prior to regaining stable employment from a total universe of 82,672 non-LTU worker records (5.4 percent). The data for the non-LTU workers shows a large variability of number of participants among training programs: Occupational Skills and Intensive Skills training had 2,297 and 1,977, respectively while Remedial training and Mentoring had 148 and 87, respectively. Still,

Table 4.16. Wage Effects Analysis: Declining Manufacturing Industries, No Long-term Unemployment

		JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI
		Wage Difference Dependent Variable (Quarterly)								
Coeff.	Non-interacted	-173.11	-309.18	-353.41	-479.98	-230.22	231.00	-236.30	-248.49	329.21
T-stat.		-1.77	-1.64	-1.99	-2.88	-0.33	1.12	-0.36	-0.78	1.69
F-stat.		58.16	57.59	58.46	59.20	57.81	57.88	57.82	57.90	57.85
R-sqd.		0.07	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.06
Observ.		4,491	173	1,977	2,297	148	589	87	455	390
Coeff.	Female	129.88	-435.65	93.97	201.17	-401.55	424.99	-114.35	-408.36	382.98
T-stat.		2.01	-0.52	1.65	2.30	-1.28	0.66	-1.09	-0.64	2.07
F-stat.		49.86	49.64	50.13	50.74	49.57	49.65	49.56	49.71	49.58
R-sqd.		0.07	0.06	0.07	0.07	0.06	0.06	0.05	0.06	0.06
Observ.		1,830	68	762	902	56	227	35	187	160
Coeff.	White	-199.40	213.38	-19.77	-77.95	10.96	-99.37	138.79	4.00	367.97
T-stat.		-1.95	0.73	-1.06	-0.24	1.01	-1.15	0.45	0.01	0.56
F-stat.		49.85	49.63	50.20	50.90	49.56	49.66	49.56	49.65	49.60
R-sqd.		0.07	0.06	0.07	0.07	0.06	0.06	0.06	0.06	0.06
Observ.		2,330	88	998	1,172	81	313	47	232	210
Coeff.	Age	-38.06	-53.31	-43.40	-56.62	42.41	-35.63	-48.74	-65.15	-76.49
T-stat.		-3.40	-1.69	-2.41	-3.42	0.50	-1.05	-0.74	-2.07	-1.69
F-stat.		49.83	49.61	50.13	50.94	49.68	49.61	49.56	49.74	49.66
R-sqd.		0.07	0.06	0.07	0.07	0.06	0.06	0.05	0.07	0.06
Observ.		4,491	173	1,977	2,297	148	589	87	455	390
Coeff.	Young	-24.24	-32.94	-18.04	-7.69	-44.38	-37.48	-59.30	-40.32	-14.03
T-stat.		-0.90	0.98	-1.45	-0.19	-0.33	-1.69	-0.90	1.94	-0.76
F-stat.		14.06	14.19	14.17	14.25	14.06	14.02	14.07	14.25	14.07
R-sqd.		0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.04
Observ.		390	16	170	205	14	54	8	36	33
Coeff.	Old	-47.13	-124.53	-32.23	-56.25	180.34	-84.26	-167.01	-78.70	-114.63
T-stat.		-1.88	-0.93	-0.60	-1.73	0.57	-0.79	-0.89	-1.83	-0.77
F-stat.		12.10	11.99	12.26	12.93	11.96	11.94	11.92	12.11	11.89
R-sqd.		0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.04
Observ.		656	26	284	336	22	84	12	68	59

Table 4.17. Wage Effects Analysis: Declining Manufacturing Industries, Long-term Unemployment

		JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI
		Wage Difference Dependent Variable (Quarterly)								
Coeff.	Non-interacted	-287.26	27.04	5.03	21.52	10.57	-315.48	113.47	-66.23	215.78
T-stat.		-1.74	0.06	1.03	0.12	0.02	-1.79	1.02	-1.87	1.20
F-stat.		28.60	28.25	28.25	28.25	28.25	28.57	28.60	28.85	28.31
R-sqd.		0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.06	0.06
Observ.		1,215	56	600	554	96	59	35	297	50
Coeff.	Female	80.11	-334.73	-174.85	-81.05	241.87	674.97	-233.23	-120.69	122.71
T-stat.		1.78	-0.63	-0.47	-1.22	0.70	0.71	-1.18	-0.19	1.91
F-stat.		24.75	24.37	24.51	24.42	24.25	24.50	24.54	24.81	24.48
R-sqd.		0.06	0.06	0.06	0.06	0.06	0.06	0.05	0.06	0.06
Observ.		629	27	315	285	50	31	18	157	25
Coeff.	White	285.32	-174.77	-142.65	385.05	-226.72	632.32	-436.19	200.38	-1045.97
T-stat.		1.18	-0.19	-1.78	1.11	-1.19	0.69	-0.18	1.81	-0.72
F-stat.		25.08	24.21	24.97	24.59	24.21	24.59	24.51	25.36	24.31
R-sqd.		0.07	0.06	0.06	0.06	0.06	0.06	0.05	0.06	0.06
Observ.		570	28	296	259	47	28	16	145	24
Coeff.	Age	-36.10	14.70	-3.64	-33.12	-37.46	14.12	-24.56	-28.67	-41.61
T-stat.		-2.97	0.30	-0.19	-1.80	-0.58	0.29	-0.34	-0.93	-1.92
F-stat.		24.79	24.48	25.22	24.37	24.22	24.75	24.53	24.81	24.36
R-sqd.		0.06	0.06	0.07	0.06	0.06	0.06	0.06	0.07	0.06
Observ.		1,215	56	600	554	96	59	35	297	50
Coeff.	Young	-27.30	112.54	18.53	-40.97	-82.99	88.47	162.88	-52.78	-30.59
T-stat.		-1.92	0.91	0.47	-1.76	-1.17	0.85	0.98	-2.02	-1.15
F-stat.		4.72	5.01	5.72	4.93	4.74	4.99	5.10	6.45	4.73
R-sqd.		0.04	0.03	0.04	0.04	0.04	0.04	0.03	0.04	0.04
Observ.		79	4	40	37	6	4	2	29	3
Coeff.	Old	-55.62	54.42	-19.07	-63.10	-97.30	31.95	-50.98	-94.19	-162.85
T-stat.		-1.83	0.49	-1.10	-1.71	-0.61	0.44	-1.18	-1.12	-0.76
F-stat.		5.65	5.49	5.60	5.48	5.40	5.60	5.50	5.42	5.48
R-sqd.		0.04	0.03	0.04	0.04	0.04	0.03	0.03	0.04	0.04
Observ.		184	9	99	89	16	10	6	49	8

Table 4.18. Effects Analysis: Declining Manufacturing Industries, No Long-term Unemployment

		JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI
		Time to Re-employ Dependent Variable (Quarters)								
Coeff.	Non-interacted	0.10	0.15	0.11	0.10	0.15	0.06	0.17	0.19	0.19
T-stat.		8.52	3.20	6.09	6.30	2.12	1.76	2.62	6.12	3.32
F-stat.		28.86	18.42	22.93	23.34	17.44	17.23	17.86	22.98	18.56
R-sqd.		0.09	0.08	0.09	0.09	0.08	0.09	0.08	0.09	0.09
Observ.		4,491	173	1,977	2,297	148	589	87	455	390
Coeff.	Female	-0.12	-0.07	-0.02	-0.05	0.23	0.11	-0.02	-0.03	0.11
T-stat.		-1.96	-0.49	-2.64	-1.37	1.59	1.76	-0.16	-0.47	0.93
F-stat.		25.08	15.84	19.83	20.50	15.28	15.09	15.32	19.77	16.00
R-sqd.		0.08	0.07	0.08	0.08	0.08	0.08	0.06	0.08	0.08
Observ.		1,830	68	762	902	56	227	35	187	160
Coeff.	White	-0.01	-0.01	-0.03	-0.02	0.23	0.09	0.06	0.06	-0.03
T-stat.		-0.36	-1.10	-0.92	3.31	1.59	1.42	0.46	0.97	-2.26
F-stat.		24.87	15.79	19.65	20.04	15.43	15.29	15.37	20.01	15.91
R-sqd.		0.07	0.07	0.08	0.08	0.06	0.08	0.07	0.07	0.08
Observ.		2,330	88	998	1,172	81	313	47	232	210
Coeff.	Age	0.00	0.00	0.00	0.00	-0.01	0.01	0.02	0.00	0.00
T-stat.		0.85	-1.26	-0.74	-0.66	-1.69	3.33	1.98	-0.14	-0.60
F-stat.		24.73	15.82	19.88	20.22	15.25	16.12	15.61	19.70	15.99
R-sqd.		0.09	0.08	0.09	0.09	0.08	0.09	0.08	0.09	0.09
Observ.		4,491	173	1,977	2,297	148	589	87	455	390
Coeff.	Young	0.00	0.05	0.00	-0.01	-0.04	0.01	-0.02	-0.01	0.00
T-stat.		-0.38	3.28	0.34	-1.40	-2.61	1.83	-1.08	-1.19	-1.05
F-stat.		11.60	8.64	10.94	10.01	7.57	6.65	6.42	9.24	7.51
R-sqd.		0.05	0.04	0.05	0.05	0.05	0.05	0.04	0.05	0.05
Observ.		390	16	170	205	28	54	8	36	33
Coeff.	Old	0.00	-0.04	0.00	-0.01	-0.06	0.03	0.03	0.00	0.00
T-stat.		-0.79	-3.22	-0.81	-1.51	-2.21	2.84	1.72	0.41	1.28
F-stat.		11.49	8.42	7.59	8.81	7.33	8.18	7.83	8.87	6.85
R-sqd.		0.04	0.04	0.05	0.05	0.05	0.05	0.04	0.05	0.05
Observ.		656	37	284	336	25	84	28	68	59

Table 4.19. Effects Analysis: Declining Manufacturing Industries, Long-term Unemployment

		JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI
		Time to Re-employ Dependent Variable (Quarters)								
Coeff.	**Non-interacted**	**0.39**	0.12	**0.38**	**0.40**	**0.32**	0.14	-0.01	**0.53**	**0.55**
T-stat.		**7.83**	0.67	**5.39**	**5.90**	**1.42**	0.80	-1.06	**4.59**	**2.00**
F-stat.		12.82	2.66	7.44	8.41	2.92	2.69	2.59	6.11	3.25
R-sqd.		0.07	0.06	0.07	0.07	0.07	0.07	0.05	0.07	0.07
Observ.		1,215	56	600	554	96	59	35	297	50
Coeff.	**Female**	0.09	-0.20	0.05	0.15	0.39	0.11	-0.09	0.15	0.19
T-stat.		0.90	-0.56	0.36	1.06	0.58	0.31	-0.18	0.63	0.31
F-stat.		11.05	2.36	6.38	7.28	2.54	2.31	2.23	5.26	2.79
R-sqd.		0.07	0.06	0.07	0.07	0.07	0.07	0.06	0.07	0.07
Observ.		629	27	315	285	50	31	18	157	25
Coeff.	**White**	**0.20**	**1.00**	**0.26**	0.16	0.26	-0.01	**-0.40**	0.17	0.55
T-stat.		**2.16**	**2.91**	**1.92**	1.23	0.56	-0.02	**-1.51**	0.72	0.98
F-stat.		12.20	3.62	7.19	7.60	2.57	2.31	2.52	5.37	2.95
R-sqd.		0.07	0.06	0.07	0.07	0.07	0.07	0.06	0.07	0.07
Observ.		570	28	296	259	47	28	28	145	24
Coeff.	**Age**	0.00	-0.02	0.01	0.00	0.02	0.00	-0.01	-0.01	-0.02
T-stat.		-0.48	0.83	0.73	0.37	0.62	0.09	-0.43	-0.58	-0.57
F-stat.		11.04	2.37	6.44	7.22	2.55	2.31	2.25	5.30	2.84
R-sqd.		0.07	0.06	0.07	0.07	0.07	0.06	0.06	0.07	0.07
Observ.		1,215	56	600	554	96	59	35	297	50
Coeff.	**Young**	0.00	0.05	**0.00**	**0.03**	0.06	-0.03	0.02	0.04	0.00
T-stat.		-0.25	0.85	**1.34**	**1.29**	0.81	-0.51	1.21	0.95	0.01
F-stat.		5.78	1.90	3.25	4.11	2.00	1.92	1.87	3.45	2.49
R-sqd.		0.04	0.03	0.04	0.03	0.04	0.03	0.03	0.04	0.03
Observ.		79	4	40	37	6	4	2	29	3
Coeff.	**Old**	**-0.11**	-0.02	**-0.12**	**-0.03**	0.03	-0.04	0.02	**-0.16**	0.04
T-stat.		**-1.83**	-1.06	**-1.93**	**-1.69**	0.57	-0.99	0.39	**-2.17**	0.55
F-stat.		8.82	1.99	5.94	6.10	2.11	2.21	1.90	3.69	2.04
R-sqd.		0.05	0.03	0.04	0.05	0.04	0.03	0.03	0.05	0.03
Observ.		184	9	99	89	16	10	6	49	8

the latter two training services had a sufficient number of observations to produce potentially significant results.

4.3.2.1.2. LTU Workers

Tables 4.17 (wage dependent variable) and 4.19 (time dependent variable) show that 1,215 LTU participants received job training services from a total universe of 8,273 LTU workers (14.7 percent) leaving the identified declining industries. Occupations Skills had 554 trainees and Intensive Skills training 600 with Mentoring and Remedial Skills trainees numbering 35 and 96 respectively. The finding that 14.7 percent of the LTU workers compared to only 5.4 percent of the non-LTU workers sought job training services reflects the perceived greater need for those services among the LTU workers leaving declining manufacturing industries.

The retraining of workers transitioning from the structurally declining Manufacturing super-sector is especially important because they historically have been the linchpin of many local economies throughout the state of Georgia. Proportionately, many more LTU workers left manufacturing and sought job training services than non-LTU workers. This finding underscores the importance of GDOL-delivered job training services to workers exiting this structurally changing sector.

4.3.2.2. Wage Effects Attributable to Job Training Services

Figure 4.2 is an inter-sectoral transition diagram depicting the industries receiving the largest number of workers after exiting the declining manufacturing sector. Many workers leaving manufacturing entered stable employment in the Plumbing, Heating, and Air Conditioning, Non-Local (long-distance) Truck Driving, Carpets and Rugs, Hospitals, Eating and Drinking Places, Grocery and Department Stores, Help Supply

services, Executive, Legislative Office (government), and Elementary and Secondary schools. Unlike Figure 4.1 depicting workers exiting Georgia's declining industries, Figure 4.2 for the Manufacturing industries shows many more downward sloping trajectories than workers who improved their wage levels, indicative of workers not regaining their former wage levels.

Workers leaving Georgia's manufacturing sector had been paid an average $6,850 quarterly ($27,400) but most transitioned to industries paying less well.
Compared to workers leaving declining industries as a group, Manufacturing leavers were paid 4.1 percent less, but left jobs that have historically been highly sought after by less-than-college educated workers and, in many areas, provided a foundation for economically functional lower-middle class neighborhoods.

Of the top ten industries capturing employment from the declining manufacturing super-sector, average quarterly wages were higher in only two industries: Plumbing ($7,433) and Trucking ($7,821). Both the Plumbing and Trucking occupations have traditionally been male-dominated and, like the Manufacturing sector, have been a financial basis for lower middle class life. Average wages were lower in the other industries: Carpets and Rugs ($6,299), Department Stores ($3,924) and Grocery Stores ($3,516), Eating and Drinking Places ($2,638), Hospitals ($6,534), Help Supply ($5,592), Government ($6,201) and Elementary and Secondary Schools ($4,720). Most of these industries, especially restaurants and retail stores, have much lower levels of compensation and present a hardship on the workers and their families that must adjust to a poorer standard of living.

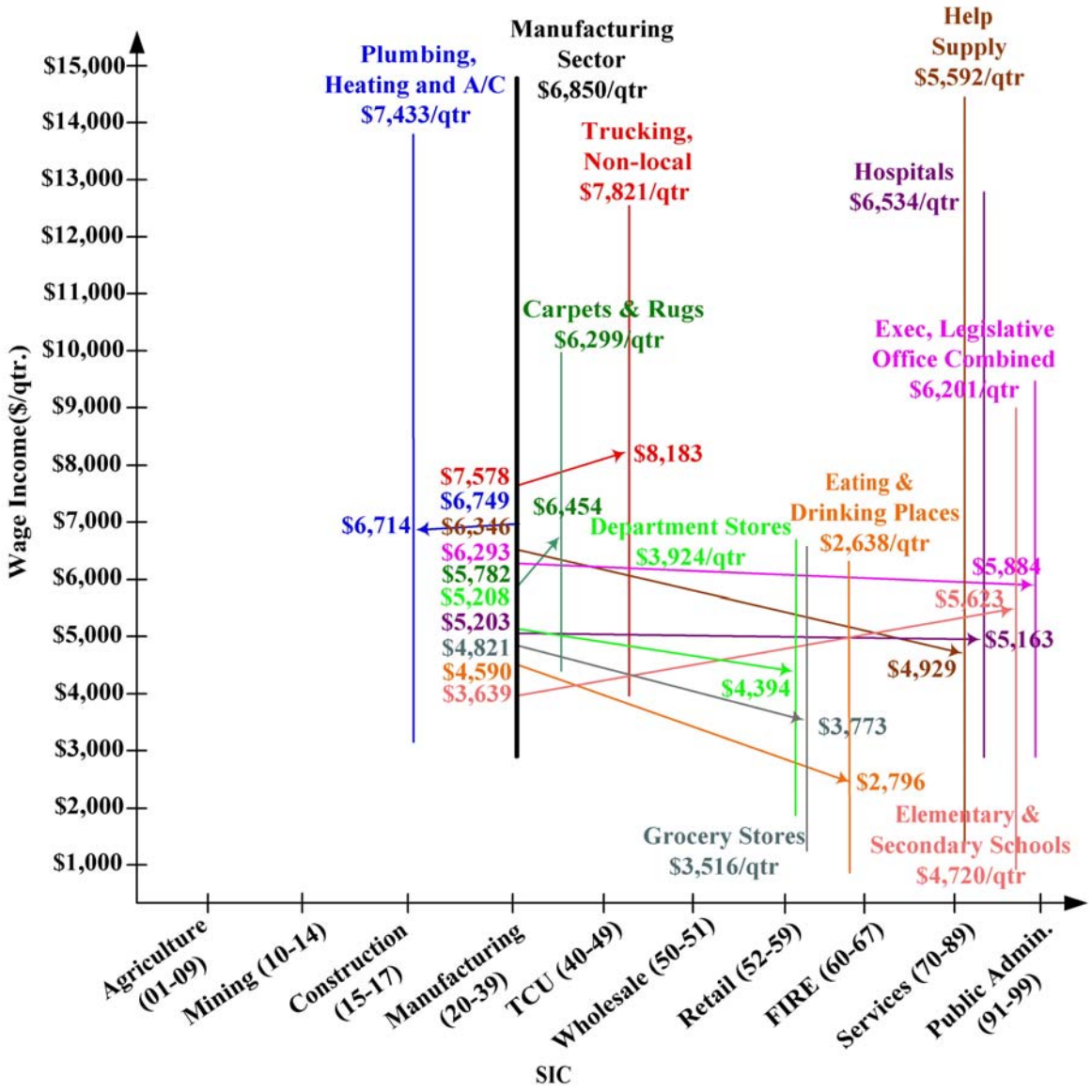

Figure 4.2. Inter-Sectoral Employment Transitions from the Manufacturing Sector Industry Wage Ranges and Averages & Average Transitional Wage Levels

Wage levels in Manufacturing varied at the 10 and 90 percent points from $3,000 to $14,500 quarterly. Most workers transitioned to industries with more compressed wage structures, most often with substantially lower average wages. Wages for Grocery and Department Stores, Eating and Drinking Places, Elementary and Secondary Schools, and government were not only lower on average than Manufacturing but also were more

limited in terms of wage advancement. Plumbing and Hospitals spanned a similar wage range to Manufacturing but often require specialized skills, potentially acquired form GDOL job training services.

Figure 4.2 shows that, of the top ten industries gaining the most workers from Manufacturing, none drew workers from the top half of the manufacturing wage distribution. Better-compensated manufacturing workers went into a more diverse group of industries, each of which failed to attract large numbers of new workers.

The long-distance Trucking Industry offered workers leaving manufacturing a unique opportunity to improve their wage position. On average, workers exiting manufacturing for Trucking increased their quarterly wages by eight percent, from $7,578 to $8,183. Workers in the Carpets and Rug industry also improved their wages, from $5,782 to $6,299, an 8.9 percent increase, a surprising finding considering the Textile industry as a whole was a declining industry during the study period. Employees leaving manufacturing for Elementary and Secondary schools improved previous wages by $1,984, a very significant 54.5 percent gain.

Most workers leaving manufacturing industries lost wages in the transition to new work, however. New plumbers lost the least, from $6,749 to $6,714, a half percent drop. Workers going to the Government sector also did not see their wage positions deteriorate substantially, a 0.8 percent loss from $5,203 to $5,163. Former manufacturing workers exiting to the Help Supply, Department Store, Grocery Store, and Eating and Drinking Places industries experienced large declines in wages: 21.7, 24.7, 27.1, and 39.1 percent, respectively. The lower a manufacturing worker was in the wage distribution, the more likely the worker transitioned to a significantly less well paying job. In manufacturing,

large numbers of exiting workers suffered steep wage declines, cutting substantially into the middle class lifestyle their previous jobs had supported. The next section addresses the question of the efficacy of GDOL job training services to workers exiting the manufacturing sector.

4.3.2.2.1. Non-LTU Workers

The average wage impact for trainees compared to non-trainees leaving declining manufacturing industries (Table 4.16) was virtually identical to the average wage impact for declining industries as a group, -$173 quarterly. Evidently, the average impact of job training services on wages for former manufacturing workers was insufficient to raise the level of human capital sufficiently to improve wages or offset other worker traits that may adversely influence wage levels.

Intensive Services and Occupational Skills training had statistically significant and adverse effects on trainee wages: -$353 and -$480, respectively. Workers from the manufacturing sector did not benefit from the basic Intensive Services process, actually a course on resume writing and personal presentation skills, nor did they benefit from Occupational Skills training, usually oriented toward office skills.

Skills Upgrade training for manufacturing industry leavers had a positive impact on quarterly wages: $329 (t=1.69, at a 10 percent level of significance). This finding tends to support the idea that some workers exiting the manufacturing sector were looking to re-train for another skill area or to update their skills. Unfortunately, relatively few of these workers—390 of 4,491 total non-LTU trainees--actually participated in Skills Upgrade training, a possible result of funding limitations for this type of training versus the relatively inexpensive walk-in Core and Intensive informational services.

The wage gains for female trainees over female non-trainee were substantial. Females receiving job training showed a $383 per quarter (t = 2.07 at a 5 percent level of significance) quarterly wage impact compared to non-trainees. Females receiving Intensive job services and Occupational Skills training also experienced more positive results: $94 and $201 quarterly wage impacts. Overall, the wage impacts from job training for females were significantly better than the average for males and females as a group. In manufacturing industries, as for declining industries overall, females significantly benefited from skills-based job training compared to female non-trainees and male trainees.

White workers leaving manufacturing and electing any job training service (JTR) experienced an average $199 per quarter lower wages than non-trainees. The wage impacts for trainees of white racial identity were not statistically significant for any specific job training service. White trainees had 15.0 percent larger adverse wage impacts that non-LTU trainees overall (all races).

Non-LTU workers leaving the manufacturing super-sector were older than non-LTU workers leaving declining industries on average, 37.4 compared to 35.0 years, probably indicative of past higher wages and job stability. The negative wage impacts associated with job training grew over time and were larger than for declining industries as a whole. Overall, trainees received $38 per quarter less in wages for each additional year of age than non-trainees. The negative age-related wage effects were greatest for recipients of Skills Upgrade training (-$77 per quarter per year) and Extended Job Search services (-$65 per quarter per year).

4.3.2.2.2. LTU Workers

Workers leaving manufacturing who received job training services and who experienced a protracted job loss of six months or more (Table 4.17, LTU workers), had more extreme adverse wage impacts than non-LTU trainees; -$287 per quarter (t=-1.74, a low significance for a 10 percent level of significance) compared to -$173 for non-LTU trainees. On-the-job training (OJT) participants and recipients of Extended Job Search services experienced worse than average wage impacts, -$315 and -$66 respectively. The adverse wage impacts on Extended Job Search participants was understandable—such searchers obviously had more difficulty in finding work—but the finding of large adverse impacts for OJT participants was unexpected.

Females, 52.3 percent of the manufacturing LTU population, experienced an average $80 per quarter positive wage impact from participating in job training compared to males. Females using Skills Upgrade training in particular had significant positive wage impacts of $123 per quarter. Other job training service categories were not statistically significant.

Whites accounted for 55.1 percent of the non-LTU population but only 46.3 percent of the LTU group, reflecting a greater share of non-white population, mostly blacks. Overall, white racial identity was not a significant predictor of trainee wage impacts for former manufacturing workers. Exceptions to this were the receipt of Intensive services, a -$143 difference for white trainees compared to non-trainees. White workers receiving Extended Job Search services benefited more than non-trainees, a positive wage impact of $200 quarterly.

LTU workers exiting manufacturing were older than LTU workers from declining industries on average: 40.5 compared to 38.9 years. Consistent with similar results for

declining industries as a group, increasing age for the manufacturing LTU population was detrimental to wage impacts from job training, -$36 per quarter per year of age, though less than for declining industries as a whole (-$50 quarterly per year). Most job training services were found to be statistically insignificant for age with Skills Upgrade training an exception (-$42).

4.3.2.3. Effects of Job Training on the Duration-of-Unemployment

4.3.2.3.1. Non-LTU Workers

Table 4.18 presents the time-to-reemploy dependent variable regression results for non-LTU workers leaving declining manufacturing industries. The non-interacted regression results show that most job training service categories were statistically significant but indicate that trainees took longer to find new work than non-trainees. As a group, non-LTU trainees from the manufacturing sector required nine days more to secure a replacement job. For the specific job training service categories, non-LTU trainees required between 5 and 17 days longer than non-trainees to find new stable work. Extended Job Search requires more time because participants use that service as a last resort after normal job search had not been productive. Skills Upgrade training usually requires more time because a typical certificate-granting course of study can take a year or longer to conclude; longer than Core, Intensive, or Occupational Skills training. For all the job training service categories, the regression results were very significant statistically—above the 5 percent level.

Overall, compared to non-trainee females, non-LTU females reduced their job search time by eleven days by receiving job training. Evidently, the time required for females to obtain training services was offset by improved marketability to employers.

For specific job training service categories with statistical significance, the reduction for female trainees versus non-trainees was modest: less than two days for receipt of Intensive Services and five days for Occupational Skills training. Remedial Skills training and OJT had adverse time effects, however; 21 days and ten days, respectively. Significance was generally low, however; at the ten percent level for Occupational Skills training.

The demographically interacted regression results for non-LTU white trainees compared to non-trainees were mixed. Whites receiving Occupational Skills training reduced their job search time by less than two days while those receiving Remedial Skills training took three weeks longer than white non-trainees and OJT white trainees eight days longer. Although non-LTU Skills Upgrade trainees overall required seventeen days longer to find work, whites receiving that training found work slightly faster than non-trainees; 2.7 days.

Job search time for non-LTU former manufacturing workers was not found to significantly depend on years of age on average (JTR) and less than a day for each additional year of age for the statistically significant training categories. The same was found to be substantially true for young and older workers as well.

4.3.2.3.2. LTU Workers

The time-to-reemploy dependent variable results are summarized in Table 4.19. Overall, workers experiencing LTU who elected job training after leaving the declining manufacturing industries took 35.6 days longer to find new work than did the LTU non-trainees. This is substantially longer then the nine extra days required to find work for non-LTU trainees exiting Manufacturing. Trainees receiving Intensive Services,

Occupational Skills training, and OJT services spent much more time unemployed than LTU non-trainees. Participants receiving Extended Job Search and Skills Upgrade training took even longer: 48.4 and 50.2 days, respectively. White trainees leaving Manufacturing often had longer periods of job search than non-trainees. Overall, white trainees took 18.3 days longer and a full quarter, 91.3 days longer, for recipients of Core Services. Intensive Services participants also took longer to find work, 23.7 days. The duration of unemployment for LTU trainees in these well-attended service categories were extreme compared to non-trainees and reflect the shortcomings of the GDOL-provided training services to these former manufacturing workers and/or the persistence of adverse personal characteristics of some workers even after training.

No statistically significant regression results were found to indicate that female trainees from manufacturing experienced either longer or shorter job search times. Similarly, no significant job search time differences were found for increased years of age for workers as a group. Statistically significant but economically small differences in job search times were found for young trainees receiving Intensive Services and Occupational Skills training. Overall, older trainees found stable employment ten days sooner than non-trainees and recipients of Intensive Services, Occupational Skills training, and Extended Job Search services found new work slightly quicker.

4.3.2.4. Job Training Service Cost-Effectiveness Analysis

4.3.2.4.1. Non-LTU Workers

Table 4.20 presents results for the cost-effectiveness analysis (CEA) for the job training programs used by workers leaving declining manufacturing industries. Only training services with positive wage impacts and reported cost data are reported. For

non-LTU job training participants (JTR), only Skills Upgrade training had a positive impact on trainees wages compared to non-trainees: $329 per quarter ($5,701 over a discounted five year period). The calculated CER for the Skills Upgrade program indicated that for each dollar invested, a wage benefit of $3.29 resulted.

For non-LTU females, all three of the job training services for which data was available—Intensive Services, Occupational Skills training, and Skills Upgrade training--had significant positive wage impacts. Occupational Skills training produced, on average, a wage impact of $3,484 at a cost of $3,250 per non-LTU female participant, a very modest benefit of $1.07 for each dollar expended. While Skills Upgrade training had the largest impacts on trainee wages, $6,632, the gains came at a relatively high participant cost of $1,735, a payoff of $3.82 for each dollar invested. For non-LTU females, the CEA analysis indicated that Intensive Services were actually superior than either Occupational Skills training or Skills Upgrade training in terms of efficiently delivering benefits to clients. For each dollar invested in Intensive Services for females, an increase of $19.23 in wages resulted.

As Table 4.21 illustrates, the time impacts on reducing the interval of unemployment for the non-LTU trainees were short with no appreciable economic benefits. Non-LTU females receiving Intensive Services found stable work 2.2 days quicker than female non-trainees at an average participant cost of $84; a $38 per day payoff from the training investment, an amount comparable to the daily wage of many entry-level workers. White trainees found stable work 2-3 days faster than non-trainees

Table 4.20. Cost Effectiveness Analysis, Wage Effects

Trainee Population	Demographic Factor	Job Training Service	Service Cost ($)	Wage Effect ($)	CER
Non-LTU					
	Non-Interacted	Skills Upgrade	$1,735	$5,701	0.30
	Female	Intensive Services	$84	$1,627	0.05
		Occupational Skills	$3,250	$3,484	0.93
		Skills Upgrade	$1,735	$6,632	0.26
LTU					
	Female	Skills Upgrade	$1,735	$2,125	0.82

for Occupational Skills and Skills Upgrade training but the time saved in job search were very small with essentially zero economic benefits. Obviously, for former manufacturing workers the rational for public investment in job training services is in the positive wage impacts, not the time saved in job search.

Table 4.21. Cost Effectiveness Analysis, Time-to-Reemploy Effects

Trainee Population	Demographic Factor	Job Training Service	Service Cost ($)	Time Effect (Days)	CER
Non-LTU					
	Female	Intensive Services	$84	2.2	$38
		Occupational Skills	$3,250	4.9	$659
	White	Occupational Skills	$3,250	2.2	$1,484
		Skills Upgrade	$1,735	3.0	$576

4.3.2.4.2. LTU Workers

For female LTU workers, only Skills Upgrade training had a positive, but modest, effect on wages, $123 per quarter so that, for every dollar spent on training, $1.23 in wage impacts were calculated for a five-year cost recovery horizon. If the CEA calculation accumulated total wage impacts for a period of five years, the resulting

impact on wages was only $2,125 and only $3,790 over ten years. The wage impact for female non-LTU workers compared to female LTU workers over five years was 3.1 times larger, diminishing the efficacy of Skills Upgrade training for LTU females. No economically significant beneficial impacts from training services on the length of job search for workers leaving manufacturing were found for LTU training participants in the non-interacted or demographically interacted regression analysis.

4.3.3. Analysis of the Textile Manufacturing Sector

4.3.3.1 Overview of the Statewide Analysis of the Textiles Sector

The employment decline of the manufacturing super-sector was led by the Textiles industry, active in rural as well as mid-sized urban areas, with net job losses of 29,002 of the total 79,595 lost statewide during the 1999-2003 study period. Textile Manufacturing has been adversely affected by structural changes resulting from the offshoring of production to lower-cost competitors including China. The primary industries from this manufacturing sector include:

- Broadwoven Fabric Mills (SIC 2211)
- Carpets and Rugs (SIC 2273)
- Yarn Spinning Mills (SIC 2281).

Like the manufacturing sector generally, the Textile industry has long been a unique source of stable employment in rural areas, especially northwest and west central Georgia. Unlike the urban areas which can better absorb large numbers of unemployed

Table 4.22. Wage Effects Analysis: Textile Manufacturing Sector, No Long-term Unemployment

		JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI
		Wage Difference Dependent Variable (Quarterly)								
Coeff.	Non-interacted	**-461.36**	-630.39	**-548.33**	**-530.14**	-	-82.30	273.27	-531.52	389.16
T-stat.		**-1.88**	0.96	**-1.76**	**-2.15**	-	-0.13	0.39	-0.98	0.66
F-stat.		10.23	9.86	10.12	10.49	-	9.71	9.73	9.87	9.78
R-sqd.		0.05	0.05	0.05	0.05	-	0.05	0.05	0.05	0.05
Observ.		1,619	171	1,069	896	22	216	58	284	225
Coeff.	Female	-162.48	-412.60	-212.29	**-470.04**	-	347.89	-134.53	341.61	**20.02**
T-stat.		-0.316	-0.73	-0.91	**-1.87**	-	0.62	-1.09	1.04	**2.12**
F-stat.		8.76	8.51	8.67	9.05	-	8.40	8.34	8.56	9.78
R-sqd.		0.04	0.04	0.04	0.05	-	0.04	0.04	0.04	0.04
Observ.		680	72	471	396	10	94	25	118	91
Coeff.	White	**210.13**	-274.10	454.09	443.30	-	583.40	438.04	201.67	392.85
T-stat.		**2.35**	-0.21	1.09	0.97	-	0.73	0.99	0.18	0.11
F-stat.		9.34	8.47	8.76	9.06	-	8.36	8.46	8.45	8.38
R-sqd.		0.04	0.04	0.04	0.04	-	0.04	0.04	0.04	0.04
Observ.		1,099	112	668	581	15	147	37	188	143
Coeff.	Age	**-41.46**	-59.28	**-45.46**	**-39.60**	-	-50.02	-54.63	**-78.22**	-45.51
T-stat.		**-1.69**	-0.95	**-2.13**	**-1.98**	-	-0.78	-0.80	**-2.40**	-1.17
F-stat.		8.78	8.47	8.69	8.99	-	8.33	8.35	8.67	8.38
R-sqd.		0.05	0.05	0.05	0.05	-	0.05	0.05	0.05	0.05
Observ.		1,619	171	1,069	896	22	216	58	284	225
Coeff.	Young	39.60	**116.51**	-87.83	71.95	-	-130.61	-186.88	186.27	-47.02
T-stat.		0.61	**1.76**	-0.93	0.62	-	-0.81	-1.26	1.00	-0.19
F-stat.		4.41	4.84	4.39	4.59	-	4.20	4.30	4.34	4.19
R-sqd.		0.03	0.04	0.03	0.03	-	0.03	0.03	0.03	0.03
Observ.		231	26	163	126	3	32	8	42	32
Coeff.	Old	**-79.28**	-139.33	-73.13	-80.22	-	-161.80	-142.70	-23.78	-41.25
T-stat.		**-1.92**	-0.95	-0.81	-0.95	-	-0.88	-0.75	-1.15	-0.26
F-stat.		2.55	2.24	2.35	2.47	-	2.24	2.23	2.58	3.05
R-sqd.		0.03	0.03	0.03	0.03	-	0.03	0.03	0.03	0.03
Observ.		165	17	108	95	2	23	6	29	24

Table 4.23. Wage Effects Analysis: Textile Manufacturing Sector, Long-term Unemployment

		JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI
		Wage Difference Dependent Variable (Quarterly)								
Coeff.	**Non-interacted**	**-351.60**	-725.51	-257.77	**-212.77**	-	**424.33**	-332.98	-293.45	-34.52
T-stat.		**-5.22**	-1.07	-0.15	**-1.71**	-	**1.84**	-1.11	-0.44	-0.21
F-stat.		5.40	5.28	5.01	5.13	-	5.35	5.43	5.12	6.11
R-sqd.		0.05	0.05	0.05	0.05	-	0.05	0.05	0.05	0.05
Observ.		575	47	229	292	4	32	34	133	43
Coeff.	**Female**	**279.36**	-246.91	412.10	-432.74	-	-73.37	192.61	**502.45**	211.32
T-stat.		**2.13**	-0.18	0.96	-1.51	-	-0.04	0.12	**1.96**	0.95
F-stat.		4.66	4.55	4.39	4.39	-	4.59	4.65	4.49	6.11
R-sqd.		0.04	0.04	0.04	0.04	-	0.04	0.04	0.04	0.04
Observ.		330	25	120	162	2	18	19	71	23
Coeff.	**White**	113.75	-141.65	-645.94	690.91	-	867.08	-89.29	-219.20	111.25
T-stat.		0.23	-0.10	-1.10	0.83	-	0.37	-0.04	-0.87	0.66
F-stat.		4.70	4.52	4.66	4.57	-	4.61	4.65	4.46	6.11
R-sqd.		0.05	0.04	0.05	0.04	-	0.04	0.05	0.04	0.04
Observ.		314	24	125	155	2	18	19	77	23
Coeff.	**Age**	-13.89	10.14	5.37	-8.16	-	-8.58	-3.56	-24.14	-32.35
T-stat.		-0.58	0.14	0.15	-0.20	-	-0.09	-0.04	-0.39	0.85
F-stat.		5.06	4.63	4.73	4.54	-	4.61	4.69	4.41	6.11
R-sqd.		0.05	0.05	0.05	0.05	-	0.05	0.05	0.05	0.05
Observ.		575	47	229	292	4	32	34	133	43
Coeff.	**Young**	**128.64**	249.71	**149.98**	**191.22**	-	139.42	-37.81	106.07	51.26
T-stat.		**2.19**	0.66	**1.98**	**2.11**	-	0.90	-0.83	0.76	1.05
F-stat.		3.31	1.61	2.98	3.18	-	1.90	1.94	1.95	2.06
R-sqd.		0.03	0.02	0.03	0.03	-	0.02	0.02	0.02	0.01
Observ.		348	28	139	175	2	19	20	80	26
Coeff.	**Old**	-43.98	32.64	-13.43	-98.91	-	4.77	-24.89	-121.01	-25.65
T-stat.		-0.77	0.21	-0.15	-0.82	-	0.02	-0.11	-0.82	0.13
F-stat.		2.61	2.53	2.47	2.36	-	2.46	2.48	2.36	3.32
R-sqd.		0.03	0.03	0.03	0.03	-	0.03	0.03	0.03	0.03
Observ.		94	8	37	46	1	5	6	21	7

workers changing industries, many of these rural areas have been severely affected by deep and prolonged structural unemployment.

4.3.3.1.1. Non-LTU Workers

Non-LTU workers leaving the Textile sector and finding new stable employment, the focus of Tables 4.22 (wage dependent variable) and 4.23 (time dependent variable), numbered 1,619 out of a total universe of 28,516 workers (5.7 percent) finding stable work in Georgia. Intensive Services and Occupational Skills training served 896 and 1,069 workers leaving the Textiles Industry. Mentoring and Remedial Skills training provided services for only 22 and 58, respectively.

4.3.3.1.2. LTU Workers

Tables 4.24 (wage dependent variable) and 4.25 (time dependent variable) show that from a universe of 3,215 LTU workers finding stable employment after leaving the Textiles industry, 575 (17.9 percent) received job training services. This proportion of LTU workers receiving job services was as high as any of the declining industry and reflects the importance of training to the Textile worker population. The largest training categories for these workers were Occupational Skills, 292 participants, and Intensive Services, 229 participants. The least utilized training categories were OJT, 32 participants, and Remedial Skills training, with only four participants.

4.3.3.2. Wage Effects Attributable to Job Training Services

The inter-sectoral employment transition diagram, Figure 4.3 shows almost all workers leaving the Textile industry lost ground on wages. Wages, which averaged $5,742 per quarter in the Textiles industry during the 1999-2003 study period were, on average, lower in most of the receiving industries: Help Supply Services, Home

Table 4.24. Effects Analysis: Textile Manufacturing Sector, No Long-term Unemployment

		JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI
		Time to Re-employ Dependent Variable (Quarters)								
Coeff.	**Non-interacted**	**0.14**	**0.17**	**0.08**	**0.11**	-	-0.03	-0.01	**0.22**	**0.37**
T-stat.		**3.81**	**1.84**	**1.71**	**2.16**	-	-0.31	-0.09	**2.95**	**1.70**
F-stat.		11.37	9.47	9.39	9.69	-	8.91	8.90	10.37	9.28
R-sqd.		0.05	0.04	0.04	0.05	-	0.04	0.04	0.05	0.04
Observ.		1,619	171	1,069	896	22	216	58	284	225
Coeff.	**Female**	**-0.17**	-0.18	**-0.18**	**-0.24**	-	0.16	-0.10	**-0.26**	-0.02
T-stat.		**-1.66**	-0.69	**-1.89**	**-2.35**	-	0.84	-0.48	**-1.71**	0.26
F-stat.		10.40	8.21	8.78	9.34	-	7.70	7.68	9.43	9.28
R-sqd.		0.05	0.04	0.04	0.05	-	0.04	0.04	0.05	0.04
Observ.		680	72	471	396	10	94	25	118	91
Coeff.	**White**	-0.05	-0.08	-0.05	**-0.17**	-	0.19	-0.02	-0.13	**-0.98**
T-stat.		-0.65	0.42	-0.57	**-1.59**	-	1.03	-0.09	-0.89	**-2.01**
F-stat.		9.79	8.24	8.07	8.39	-	7.97	7.64	8.90	8.44
R-sqd.		0.05	0.04	0.04	0.04	-	0.04	0.04	0.04	0.04
Observ.		1,099	112	668	581	15	147	37	188	143
Coeff.	**Age**	0.00	0.00	0.00	0.00	-	0.00	-0.01	**0.01**	**0.07**
T-stat.		0.92	0.54	0.62	1.05	-	0.30	-0.74	**1.73**	**1.87**
F-stat.		9.78	8.13	8.06	8.39	-	7.64	7.74	9.23	8.44
R-sqd.		0.06	0.04	0.04	0.05	-	0.04	0.04	0.05	0.05
Observ.		1,619	171	1,069	896	22	216	58	284	225
Coeff.	**Young**	**0.02**	**0.09**	0.01	0.01	-	**0.05**	-0.02	-0.01	**0.07**
T-stat.		**2.39**	**3.16**	0.97	0.64	-	**2.12**	-0.86	-0.44	**1.94**
F-stat.		6.38	6.04	4.79	4.62	-	5.16	4.65	4.67	5.40
R-sqd.		0.05	0.05	0.04	0.03	-	0.04	0.03	0.03	0.04
Observ.		231	26	163	126	3	32	8	42	32
Coeff.	**Old**	-0.01	**-0.04**	-0.01	**-0.01**	-	0.00	0.00	-0.01	0.01
T-stat.		-0.81	**-1.95**	-0.45	**-1.30**	-	0.03	0.00	-0.41	-0.97
F-stat.		3.74	3.62	2.93	3.76	-	2.71	2.68	4.25	3.71
R-sqd.		0.05	0.04	0.03	0.05	-	0.03	0.03	0.05	0.03
Observ.		165	17	108	95	2	23	6	29	24

Table 4.25. Effects Analysis: Textile Manufacturing Sector, Long-term Unemployment

		JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI
		Time to Re-employ Dependent Variable (Quarters)								
Coeff.	**Non-interacted**	**0.38**	**0.56**	**0.23**	0.18	-	0.40	0.36	-0.14	-0.26
T-stat.		**3.50**	**2.08**	**1.53**	1.08	-	1.23	1.14	-0.54	-1.26
F-stat.		6.94	2.97	1.98	1.39	-	1.56	1.45	0.95	0.97
R-sqd.		0.05	0.02	0.02	0.01	-	0.01	0.01	0.01	0.01
Observ.		575	47	229	292	4	32	34	133	43
Coeff.	**Female**	0.20	-0.30	0.15	**0.43**	-	0.71	0.05	0.09	-0.04
T-stat.		1.01	-0.56	0.53	**1.28**	-	1.08	0.09	0.16	-0.30
F-stat.		6.15	2.79	1.71	1.64	-	1.71	1.25	0.81	0.97
R-sqd.		0.04	0.02	0.01	0.01	-	0.01	0.01	0.01	0.01
Observ.		330	25	120	162	2	18	19	71	23
Coeff.	**White**	**0.54**	**1.99**	**0.49**	**0.56**	-	0.08	-1.13	0.50	0.33
T-stat.		**2.78**	**3.69**	**1.60**	**1.69**	-	0.08	-1.23	0.90	0.45
F-stat.		6.43	5.61	1.87	1.60	-	0.89	1.28	0.75	0.65
R-sqd.		0.05	0.05	0.02	0.01	-	0.01	0.01	0.01	0.00
Observ.		314	24	125	155	2	18	19	77	23
Coeff.	**Age**	0.00	-0.02	0.00	0.01	-	-0.04	-0.03	0.02	0.01
T-stat.		-0.48	-0.78	0.29	0.70	-	-1.00	-0.71	0.78	0.03
F-stat.		3.99	1.87	1.15	0.93	-	1.18	0.98	0.71	0.00
R-sqd.		0.04	0.02	0.01	0.01	-	0.01	0.01	0.01	0.00
Observ.		575	47	229	292	4	32	34	133	43
Coeff.	**Young**	0.00	-0.08	**0.08**	0.07	-	0.01	0.01	**0.10**	0.06
T-stat.		0.06	-0.40	**1.91**	1.28	-	0.11	0.11	**1.84**	0.06
F-stat.		3.35	2.14	2.73	1.90	-	2.04	2.21	2.18	1.90
R-sqd.		0.04	0.03	0.04	0.02	-	0.03	0.03	0.03	0.02
Observ.		348	28	139	175	2	19	20	80	26
Coeff.	**Old**	0.00	-0.03	-0.03	-0.02	-	-0.04	0.03	-0.03	-0.06
T-stat.		0.11	-0.68	-0.92	-0.57	-	-0.62	0.40	-0.62	-0.65
F-stat.		2.45	1.50	1.45	1.31	-	1.00	0.90	0.97	1.22
R-sqd.		0.03	0.02	0.02	0.02	-	0.01	0.01	0.01	0.01
Observ.		94	8	37	46	1	5	6	21	7

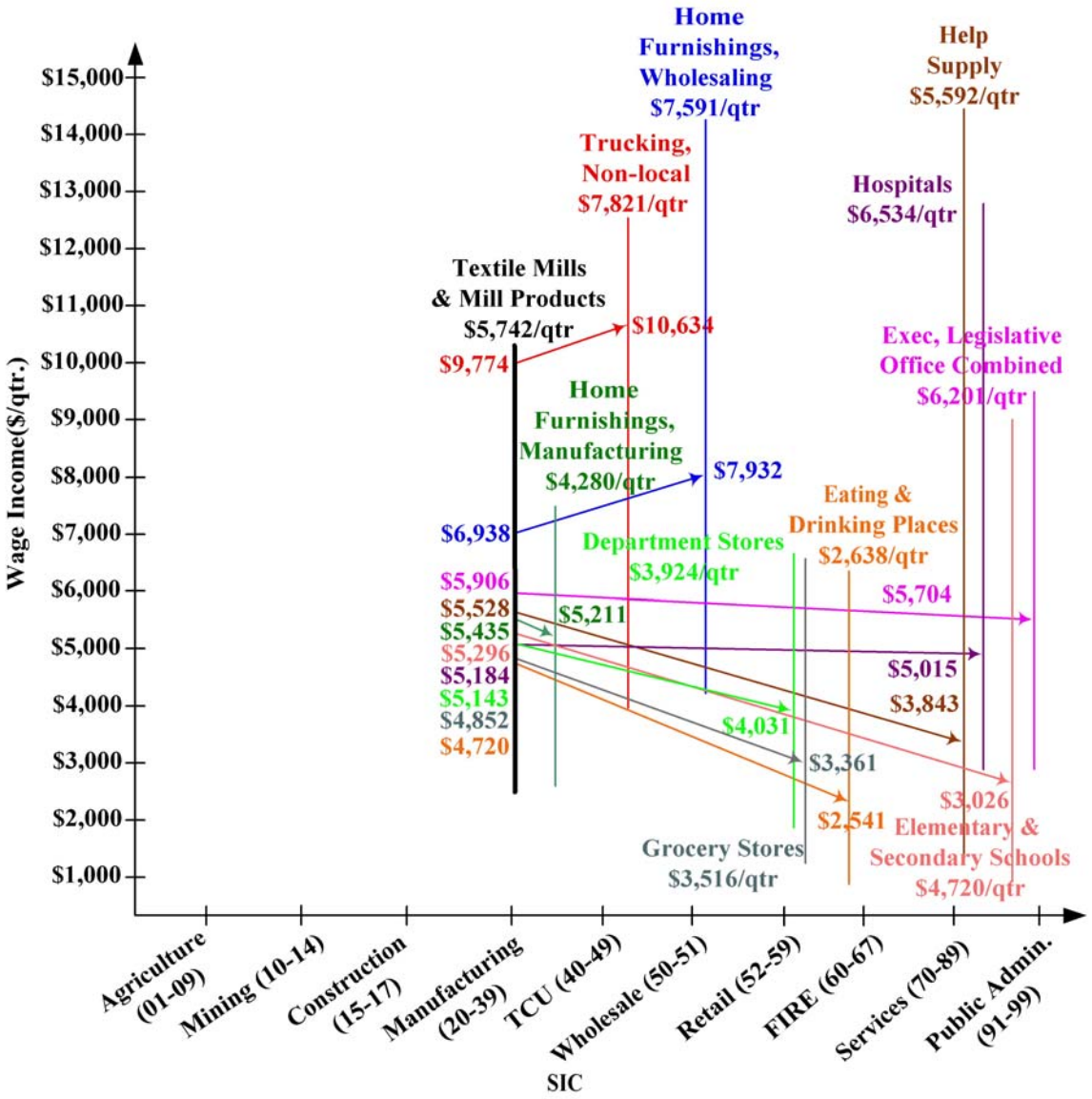

Figure 4.3. Inter-Sectoral Employment Transitions from Texile Sector, Industry Wage Ranges and Averages & Average Transitional Wage Levels

Furnishings Manufacturing, and Elementary and Secondary Schools. Average industry quarterly wages were even lower in Department Stores, Grocery Stores, and Eating and Drinking Places.

Only Textile industry leavers finding work in long-distance Trucking and the Home Furnishings Wholesaling found higher average wages in their new work. The individual wage experience of transitioning ex-textile workers was worse than the average industry wage differentials would suggest. Workers transitioning to Home Furnishings Manufacturing, Government, and Hospitals, lost the least, $224 (4.1 percent), $202 quarterly (3.4 percent), and $169 (3.3 percent.). Wage declines were steeper for former Textile workers going to the Help Supply Services ($1,685, 30.5 percent), Department Stores ($1,112, 21.6 percent), Grocery Stores ($1,491, 30.7 percent), Elementary and Secondary Schools ($2,270, 42.9 percent), and Eating and Drinking Places ($2,719, 46.2 percent) industries.

4.3.3.2.1. Non-LTU Workers

The wage and demographic effects of non-LTU workers exiting the Textile industry and receiving job training services are shown in Table 4.22. For all non-LTU workers receiving job training services, wages averaged $461 less per quarter than non-trainees. Thus former Textile workers fared less well than all workers leaving declining industries as a group (-$172) and Manufacturing workers overall (-$173). Comparatively greater adverse wage impacts were also experienced by Textile workers receiving Intensive Services (-$548) and Occupations Skills training (-$530). Unlike former Manufacturing trainees, the $389 point estimate for Skills Upgrade training from Textiles was a statistically insignificant t=0.66. Former Textile workers did not seek Skills Upgrade training in large numbers as might have been expected.

Unlike many other manufacturing industries, female trainees from the Textile industry did not fare significantly better than female non-trainees. For the Skills Upgrade

track, females trainees showed only a $20 wage improvement per quarter over non-trainees. White trainees had a $210 per quarter wage advantage over white non-trainees. No other training service program categories showed statistically significant wage impacts for white racial identity.

Wage effects resulting from age were consistent with the Manufacturing sector and the declining sectors as a group. Overall for Textile trainees, a negative wage impact, -$41, resulted for each year of additional age for trainees compared to non-trainees. Intensive Services Occupational Skills training, and Extended Job Search also had negative wage effects: -$45, -$40, and -$78 per quarter per year. However, young workers positively benefited from each addition year; about $117 per quarter per year, a departure from the wage trends for older workers (-$79) and declining workers as a group. This finding suggests that younger Textile trainees are viewed more favorably than middle aged and older trainees.

4.3.2.2.2. LTU Workers

Compared to Textile non-LTU Trainees, LTU trainees experienced less severe adverse wage impacts on average, $110 quarterly although Occupational Skills trainees experienced lower wage than non-trainees (Table 4.23). Counter to other OJT results, LTU trainees had a positive wage impact of $424 per quarter. Other job service programs showed negative, but statistically insignificant, wage impacts.

Wage impacts for female trainees were $279 per quarter and $502 for Extended job Search more than for female non-trainees. No statistically significant results were in evidence for white racial identity or for age for all workers as a group. Young LTU workers, similar to the non-LTU workers, reflected a positive wage impacts: $129 per

quarter per year of additional age and $149 and $191 for Intensive Services and Occupational Skills training. The data suggests that, at least for young workers from the Textiles industries, the wage grow over time. Older trainees showed no significant difference in wage impacts compare to non-trainees.

4.3.3.3. Effects of Job Training on the Duration-of-Unemployment

4.3.3.3.1. Non-LTU Workers

Table 4.24 details the duration-of-unemployment effects of job training services for workers leaving the Textiles industries. The non-interacted regression results show that all impacts are positive, indicative of adverse time impacts on trainees compared to non-trainees. Overall, all workers electing job training require 12.8 more days to find work than do non-trainees. The time effects vary widely: 7.3 days for Intensive Services trainees, 10.0 days for Occupational Skills training, 15.5 days for Core Services, 20.0 days for Extended Job Search, and 33.8 days longer for Skills Upgrade training.

The impact of job training on the job search time for females indicated that, overall, they required 15.5 days less time to find work than female non-trainees. Female trainees receiving Intensive Services took about the same: 16.4 days. Females receiving Occupational Skills training and Extended Job Search services found new stable work substantially quicker, 21.9 and 23.7 days, respectively. The data indicates that the additional time required for Extended Job Search can be offset by the benefits of training, at least for females from Textiles.

White Occupational Skills trainees found work faster than non-white trainees and those receiving Skills Upgrade training were hired 89.4 days quicker than non-whites. This finding for Skills Upgrade training suggests that, at least for whites from Textile

industries, the time for job search can be substantially reduced by finding the right training. On average, the time impacts associated with job training were small—1.8 to 8.2 days longer to find new work. Older trainees experienced minimal, but positive, benefits:

4.3.3.3.2. LTU Workers

For LTU trainees, Table 4.25, the time penalties for job training services were greater than for the non-LTU Textile workers; some of the largest encounter in this research. Overall, job trainees took 34.7 days longer to find work than non-trainees. Recipients of Core Services took even longer: 51.1 days longer. The other job services categories were statistically insignificant but the point estimates were mostly positive, indicative of longer search intervals for trainees.

The findings for LTU females from Textiles industries were statistically insignificant. White trainees needed substantially more time to find new than white non-trainees; requiring 49.3 more days. Whites receiving Intensive Services or Occupational Skills training took an average of 45 days to find work. The white recipients of Core Services took a full two quarters longer than white non-trainees. Age was not found to have a significant effect on the time required for job search; either for all workers as a group or for younger or older workers as sub-groups.

Whether the extremely long job search times for LTU trainees were due to the difficulty of some workers transitioning from a structurally declining industry to find new stable employment or from the personal characteristics of these workers cannot be determined from the available data. The findings make it obvious, however, that workers

who were once stably employed for six or more months in the Textiles sector found it very difficult to find new stable work.

4.3.3.4. Job Training Service Cost-Effectiveness Analysis

4.3.3.4.1. Non-LTU Workers

Table 4.26 summarizes the cost-effectiveness calculations for the former Textile non-LTU job service recipients resulting from positive wage impacts from training. There were two training tracts with statistically significant and positive wage effects: females receiving Skills Upgrade training experienced a $20 per quarter positive impact compared to male trainees and white trainees had a $210 overall impact over non-white trainees. Data was available only for the Skills Upgrade tract which showed a cost-effectiveness ratio of 5.0; reflecting a less-than-cost-beneficial payoff of $0.20 for each dollar invested in training.

Although non-LTU female and white trainees showed reductions in job search time from Occupational Skills and Skills Upgrade training (Table 4.27), only Intensive Services for female trainees efficiently decreased the time spent unemployed at a program cost of $5 a day. For Occupational Skills training, a day saved in job search for female trainees cost $146 of program funds. White Occupational Skills trainees found a job one day faster than males for each $215 spent. Even white Skills Upgrade trainees, who reduced their job search time by almost three months compared to non-whites, cost about $19 for each day saved. The time impacts were insufficient to justify the expenditure of public funds in the absence of positive wage impacts.

Table 4.26. Cost Effectiveness Analysis, Wage Effects

Trainee Population	Demographic Factor	Job Training Service	Service Cost ($)	Wage Effect ($)	CER
Non-LTU					
	Female	Skills Upgrade	$1,735	$347	5.0

Table 4.27. Cost Effectiveness Analysis, Duration of Unemployment Effects

Trainee Population	Demographic Factor	Job Training Service	Service Cost ($)	Time Effect (Days)	CER
Non-LTU					
	Female	Intensive Services	$84	16.3	$5
		Occupational Skills	$3,250	22.3	$146
	White	Occupational Skills	$3,250	15.1	$215
		Skills Upgrade	$1,735	89.5	$19

4.3.3.4.2. LTU Workers

There were significant positive wage impacts from GDOL job training services for LTU female trainees over male trainees, $279 quarterly for job training services as a composite group, as well as $502 quarterly for Extended Job Search but because no program cost data were available no cost-effectiveness calculations were possible. There was no demonstrated cost-effectiveness of job training services to LTU Textile trainees.

4.3.4. Analysis of the Food and Beverage Industry

4.3.4.1. Overview of the Statewide Food and Beverage Industry Analysis

Prior analyses in this research have focused on declining industries as a whole, the Manufacturing super-sector, and the Textiles sub-sector. This section investigates the wage and time impacts on recipients of job training services exiting from the Food and Beverage industry. Workers in the Food and Beverage industry differ from those in

manufacturing in terms of job-related experiences and it is reasonable to expect that their job training needs, and experiences in GDOL job training programs, may differ also.

The shift-share analysis identified a net decline of 5,691 workers in the Food and Beverage industry (NAICS 445). The cross-sector analysis estimated a turnover of 167,556 workers in the Grocery Stores industry (SIC 5411), second only to Eating Places (SIC 5810) in terms of the number of workers leaving the industry during the 1999-2003 study period. From Table 4.9 it is evident that many workers have left the Food and Beverage industry and entered a new industry, a population comparable to the numbers of workers leaving the Administration and Support Services and Textile industries. Many of these Food and Beverage workers participated in GDOL job training programs.

For this analysis, the Food and Beverage Industry consisted of Grocery Stores, Meat and Fish Markets, Fruit and Vegetable Markets, Candy Stores, Dairy Products Stores, Retail Bakeries, and Miscellaneous Food Stores[19]. Of these industry sub-groups, Grocery Stores comprised 93.6 percent of the total number of workers leaving this very large but declining, at least in terms of employment, retail sector in Georgia.

4.3.4.1.1. Non-LTU Workers

Tables 4.28 and 4.30 show that 1,188 non-LTU job training participants leaving the Food and Beverage industry received services from a total universe of 25,566 non-LTU workers (4.6 percent). There were 564 non-LTU participants receiving Occupational Skills training and 546 receiving Intensive Skills training while Mentoring and Core Services each had 12 participants. Core Services and Mentoring had too few participants to be assured that the regression results would be statistically significant.

[19] U.S. Department of Labor, Occupational Health & Safety Administration, Division G: Retail Trade, Major Group 54: Food Stores, from www.osha.gov, September 2007.

Table 4.28. Wage Effects Analysis: Food and Beverage Retail Sector, No Long-term Unemployment

		JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI
		Wage Difference Dependent Variable (Quarterly)								
Coeff.	Non-interacted	50.32	-180.74	23.42	240.19	-61.69	109.01	-20.01	252.69	397.47
T-stat.		2.25	-0.44	2.19	1.84	-2.27	2.17	-1.67	1.17	2.02
F-stat.		50.58	50.61	50.58	50.70	50.86	50.58	50.93	50.82	50.76
R-sqd.		0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Observ.		1,188	12	546	564	102	114	12	96	143
Coeff.	Female	92.05	-429.35	144.71	376.79	-168.64	231.42	55.15	83.51	385.16
T-stat.		1.90	0.59	0.25	1.92	-0.97	1.74	1.81	0.05	1.67
F-stat.		43.87	43.45	43.48	43.62	43.86	43.53	50.93	43.56	50.76
R-sqd.		0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Observ.		642	7	303	309	58	64	15	54	79
Coeff.	White	220.51	25.85	-199.59	-175.79	292.17	-173.51	-25.05	139.21	367.47
T-stat.		0.54	0.98	-0.35	-0.31	0.63	-0.54	-0.05	1.28	0.24
F-stat.		43.35	50.61	43.42	43.51	43.61	43.42	50.93	43.85	43.50
R-sqd.		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Observ.		615	6	266	290	52	57	6	48	76
Coeff.	Age	-18.53	22.65	-22.07	-17.79	30.46	-37.66	-13.41	-25.37	-39.63
T-stat.		-1.97	1.16	-2.08	-1.69	0.15	-2.23	-0.05	-0.70	-1.74
F-stat.		44.01	40.61	43.87	43.63	43.61	43.39	50.93	43.86	43.50
R-sqd.		0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Observ.		1,188	12	546	564	102	114	12	96	143
Coeff.	Young	-37.68	-25.65	-30.98	-66.30	31.45	-59.92	-44.65	207.43	10.20
T-stat.		-1.85	-0.08	-0.54	-1.09	0.16	-1.94	-0.96	1.03	1.85
F-stat.		23.76	26.90	23.41	23.79	23.32	23.19	27.27	23.46	23.24
R-sqd.		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Observ.		639	6	303	290	57	60	6	51	74
Coeff.	Old	44.02	21.25	34.60	92.73	2.25	-5.70	-	86.93	78.58
T-stat.		2.11	0.08	2.18	1.99	0.01	-0.58	-	0.61	1.69
F-stat.		3.41	2.59	3.56	3.71	2.59	2.25	2.59	2.80	2.25
R-sqd.		0.03	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.02
Observ.		83	1	55	56	11	11	1	7	18

Table 4.29. Wage Effects Analysis: Food and Beverage Retail Sector, Long-term Unemployment

		JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI
		Wage Difference Dependent Variable (Quarterly)								
Coeff.	Non-interacted	67.12	22.00	-86.71	141.57	-44.64	96.01	-29.46	221.48	255.46
T-stat.		1.11	2.41	-1.07	2.05	-1.99	1.84	-0.47	0.14	1.77
F-stat.		6.51	6.96	6.61	6.51	8.17	6.55	8.17	6.51	8.17
R-sqd.		0.13	0.14	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Observ.		276	23	132	144	0	45	0	38	27
Coeff.	Female	38.94	78.53	-68.45	262.51	-21.20	283.49	-10.05	-77.53	55.64
T-stat.		2.03	0.26	-0.53	2.25	-1.70	1.69	-0.03	-0.56	1.86
F-stat.		5.41	6.96	5.51	5.40	8.17	6.07	8.17	6.51	8.17
R-sqd.		0.13	0.14	0.13	0.13	0.13	0.14	0.13	0.13	0.13
Observ.		199	16	98	101	0	31	0	27	20
Coeff.	White	500.82	10.85	384.93	10.38	222.37	349.46	99.97	362.25	-125.32
T-stat.		0.22	0.26	0.47	0.02	0.95	0.53	0.97	0.96	0.66
F-stat.		5.41	6.96	5.52	6.51	8.17	5.49	8.17	6.51	8.17
R-sqd.		0.13	0.14	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Observ.		110	9	55	62	0	18	0	16	11
Coeff.	Age	-36.64	-20.27	-97.92	-100.91	-33.56	-212.26	-36.65	-22.66	-35.59
T-stat.		-0.56	-0.05	-1.03	-0.91	-0.57	-0.05	-0.95	-2.87	-2.01
F-stat.		5.46	6.96	5.50	5.41	8.17	5.72	8.17	6.87	8.17
R-sqd.		0.13	0.14	0.13	0.13	0.13	0.14	0.13	0.16	0.13
Observ.		276	23	132	144	0	45	0	38	27
Coeff.	Young	-66.90	-15.65	-136.92	-89.03	-45.59	-160.77	-21.37	-87.42	-25.99
T-stat.		-0.59	-0.03	-1.17	-0.57	-0.69	-0.97	-0.04	-3.05	-2.13
F-stat.		3.48	5.10	3.71	3.46	5.25	4.21	5.25	6.49	5.25
R-sqd.		0.07	0.09	0.08	0.07	0.07	0.09	0.07	0.13	0.07
Observ.		64	6	34	34	0	11	0	9	7
Coeff.	Old	45.57	-25.65	45.53	49.65	25.67	-55.55	-	-87.62	63.37
T-stat.		1.65	-0.66	0.27	2.26	0.37	-0.33	-	-1.14	1.89
F-stat.		2.62	3.38	2.74	2.68	3.38	3.28	3.38	3.38	3.38
R-sqd.		0.05	0.04	0.04	0.04	0.04	0.05	0.04	0.04	0.04
Observ.		30	2	14	14	0	5	0	4	3

Table 4.30. Effects Analysis: Food and Beverage Retail Sector, No Long-term Unemployment

		JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI
		Time to Re-employ Dependent Variable (Quarters)								
Coeff.	Non-interacted	**0.21**	-0.32	0.20	**0.17**	**0.20**	**0.14**	-0.02	**0.37**	**0.40**
T-stat.		**1.82**	-0.17	0.01	**2.15**	**1.43**	**2.55**	-0.10	**2.74**	**1.66**
F-stat.		8.61	8.59	8.59	8.59	8.62	9.68	8.59	9.85	8.63
R-sqd.		0.05	0.05	0.05	0.05	0.05	0.06	0.05	0.06	0.05
Observ.		1,188	12	546	564	102	114	12	96	143
Coeff.	Female	**-0.16**	0.00	-0.03	**-0.26**	0.00	**0.19**	-0.02	**0.38**	**0.35**
T-stat.		**-2.37**	0.00	-0.68	**-1.71**	-0.01	**1.37**	-0.01	**2.62**	**1.96**
F-stat.		7.39	7.36	7.48	7.69	7.39	8.54	8.59	9.50	8.63
R-sqd.		0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.04
Observ.		642	7	303	309	58	64	15	54	79
Coeff.	White	0.00	0.00	-0.01	0.00	0.00	-0.01	-0.01	**0.15**	-0.03
T-stat.		-0.05	-0.03	0.24	0.06	-0.01	-0.07	-0.95	**2.37**	-0.17
F-stat.		7.38	8.59	7.36	7.36	7.38	8.30	8.59	9.25	7.40
R-sqd.		0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.04
Observ.		615	6	266	290	52	57	6	48	76
Coeff.	Age	**0.00**	0.01	**0.00**	**0.00**	**0.00**	**0.01**	-0.09	0.00	0.00
T-stat.		**1.85**	0.03	**1.63**	**1.87**	**1.70**	**1.36**	-0.22	-0.30	-0.01
F-stat.		7.39	8.59	7.47	7.41	7.39	8.69	8.59	8.51	7.40
R-sqd.		0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Observ.		1,188	12	546	564	102	114	12	96	143
Coeff.	Young	**0.21**	0.02	**0.11**	**0.21**	0.00	**0.02**	0.00	**0.06**	0.00
T-stat.		**2.94**	1.00	**2.52**	**1.89**	0.00	**1.49**	0.00	**3.25**	0.01
F-stat.		3.23	2.59	2.89	2.95	2.25	4.20	2.59	7.14	2.24
R-sqd.		0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.05	0.02
Observ.		639	6	303	290	57	60	6	51	74
Coeff.	Old	-0.01	-0.01	**-0.04**	-0.01	-0.01	0.01	-0.01	**-0.03**	**-0.03**
T-stat.		-0.79	-0.03	**-1.72**	-0.80	-0.99	1.22	-0.34	**-2.05**	**-1.96**
F-stat.		2.88	2.07	2.94	2.84	2.07	2.91	2.07	2.48	2.91
R-sqd.		0.03	0.02	0.03	0.03	0.02	0.02	0.02	0.05	0.02
Observ.		83	1	55	56	11	12	4	16	18

Table 4.31. Effects Analysis: Food and Beverage Retail Sector, Long-term Unemployment

		JTR	COR	INT	OCC	REM	OJT	MEN	JOB	SKI
		Time to Re-employ Dependent Variable (Quarters)								
Coeff.	Non-interacted	**0.30**	0.61	-0.18	**0.50**	0.13	**0.50**	-0.24	0.77	**0.28**
T-stat.		**1.69**	0.49	-0.43	**1.90**	0.01	**1.79**	-0.05	0.87	**1.69**
F-stat.		2.70	2.85	2.81	2.66	3.34	3.16	3.34	3.26	3.34
R-sqd.		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Observ.		276	23	132	144	0	45	0	38	27
Coeff.	Female	**-0.14**	0.00	-0.61	-0.44	-0.02	-0.56	0.26	**0.14**	**0.16**
T-stat.		**-2.05**	0.00	-0.59	-0.41	-0.97	-1.08	1.03	**1.37**	**2.01**
F-stat.		2.80	2.85	2.48	2.26	3.34	3.30	3.34	3.26	3.34
R-sqd.		0.06	0.05	0.05	0.05	0.05	0.07	0.05	0.05	0.05
Observ.		199	16	98	101	0	31	0	27	20
Coeff.	White	**-0.27**	0.26	-0.16	**-0.13**	-0.01	0.28	0.36	**-0.25**	**-0.16**
T-stat.		**-2.20**	1.02	-0.12	**-1.97**	-0.29	0.20	0.97	**-1.70**	**-1.37**
F-stat.		2.24	0.73	2.33	2.66	3.34	2.70	3.34	3.26	3.34
R-sqd.		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Observ.		110	9	55	62	0	18	0	16	11
Coeff.	Age	**-0.06**	-0.02	**-0.11**	-0.02	0.37	-0.05	0.01	-0.22	**0.06**
T-stat.		**-1.65**	-1.13	**-1.99**	-0.28	1.07	-0.82	0.79	-0.57	**1.33**
F-stat.		3.73	2.85	4.70	2.22	3.34	2.97	3.34	2.91	3.34
R-sqd.		0.08	0.05	0.10	0.05	0.05	0.06	0.05	0.06	0.05
Observ.		276	23	132	144	0	45	0	38	27
Coeff.	Young	**-0.11**	0.00	**-0.12**	-0.10	0.02	-0.10	0.03	-0.22	0.21
T-stat.		**-1.62**	0.96	**-1.72**	-1.91	0.57	-0.46	0.16	-0.56	1.46
F-stat.		2.79	1.26	3.04	1.81	1.36	1.17	1.36	1.75	1.36
R-sqd.		0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Observ.		64	6	34	34	0	11	0	9	7
Coeff.	Old	0.06	0.05	0.09	0.04	-0.01	0.01	-	-0.06	0.04
T-stat.		0.29	0.03	1.03	1.56	-0.53	0.09	-	-1.95	0.05
F-stat.		1.46	1.70	1.95	1.80	1.70	2.10	1.70	1.70	1.70
R-sqd.		0.05	0.04	0.06	0.05	0.04	0.06	0.04	0.04	0.04
Observ.		30	2	14	14	0	5	0	4	3

4.3.4.1.2. LTU Workers

Tables 4.29 and 4.31 show that, of the 2,796 LTU workers leaving the Food and Beverage industry, 276 of them, 9.9 percent, received job training services. Among these LTU participants, there were no Mentoring or Remedial trainees. The counts of OJT and Skills Upgrade trainees and Extended Job Search and Core Services recipients were so few that statistical significance was unlikely. Similar to workers in other industries, Food and Beverage industry leavers finding stable new work of six months or more continuous employment most often received Intensive Services or Occupational Skills training and did not significantly participate in On-the-Job or Skills Upgrade training.

4.3.4.2. Wage Effects Attributable to Job Training Services

Figure 4.4, the Food and Beverage inter-sectoral worker employment transition diagram, shows that many former workers found stable new employment in new industries with higher average wages. Compared to workers from Georgia's declining industries as defined in this research and the Manufacturing industries as a group, workers exiting the Food and Beverage industry substantially improved their wages.

The wage distribution for the Food and Beverage industry spanned from $1,351 to $7,942 at the 10 and 90 percent points. The average quarterly wage for the Food and Beverage industry was a comparatively modest $3,871. Nine of the eleven receiving industries analyzed in this research had higher average wages than the Food and Beverage industry. The largest average industry wage increases were for the New and Used Car Dealers, Doctor's Offices, and the Hospital industries which were 86.7, 74.4, and 68.8 percent higher, respectively. Average wages in only two of the industries analyzed were lower than for the Food and Beverage industry —Child Daycare Services

($3,068 or 20.1 percent less) and Eating and Drinking Places ($2,638 or 31.9 percent less).

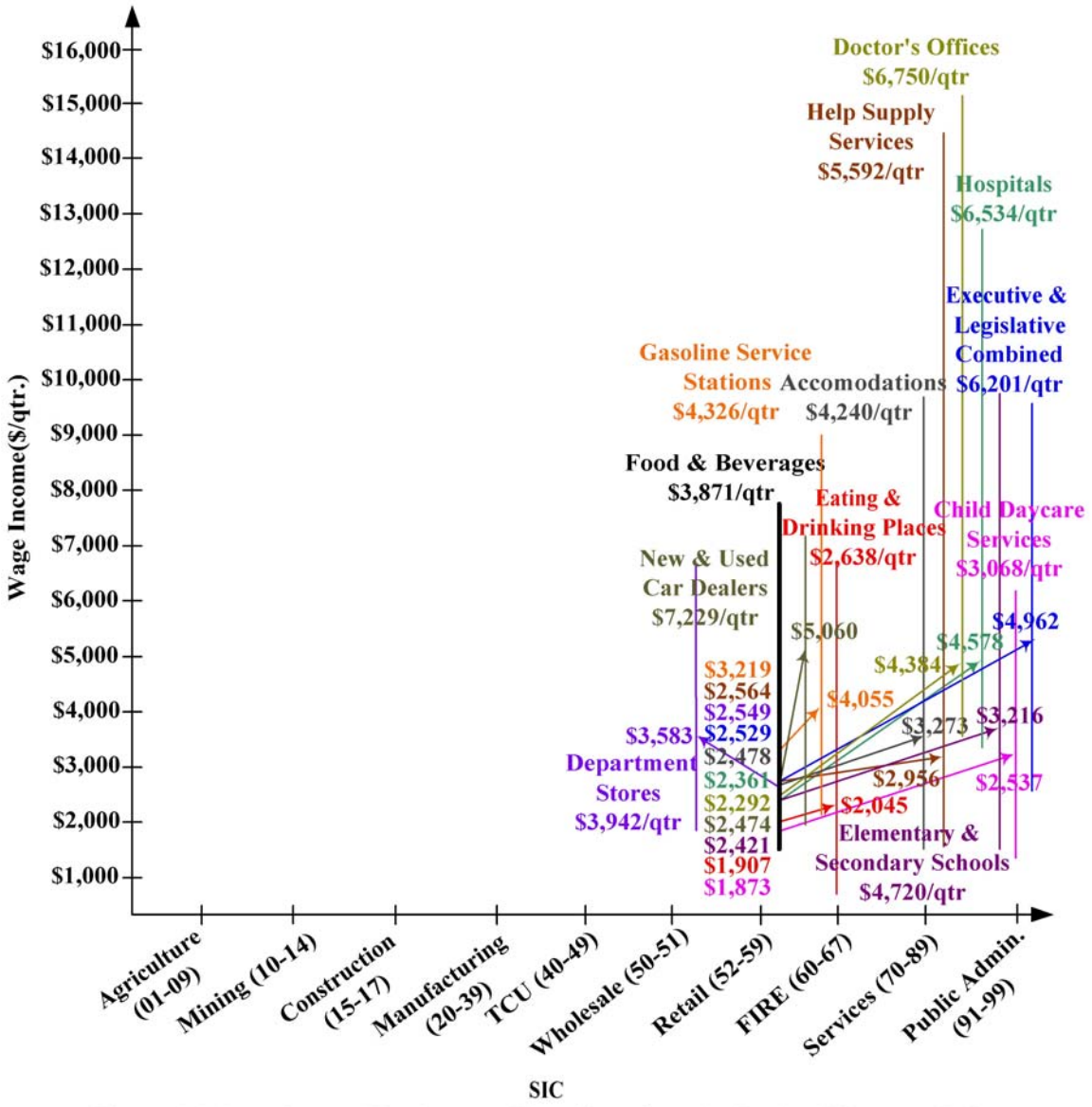

Figure 4.4. Inter-Sectoral Employment Transitions from the Food and Beverage Industry, Industry Wage Ranges & Transitional Wage Levels

For the ten top-ranked (by the number of workers exiting the Food and Beverage industry) receiving industries, all provided higher wages. Workers transitioning to the New and Used Car Dealers, Executive and Legislative, Hospitals and Doctor's Offices industries essentially doubled their wages; from about $2,400 to $4,800 quarterly. At the low end of wage gains, Food and Beverage leavers finding new work in Gasoline Service Stations, Help Supply Services, and Eating and Drinking Places increased their wages considerably by 26.0, 15.3, and 7.2 percent, respectively.

Several explanations are possible for why the transitioning Food and Beverage workers found higher wages in their new industries: 1) workers leaving that industry were among the lowest paid in that industry (wages for leavers were skewed toward the bottom of the wage distribution); 2) post-transition wages for many workers were higher in their new industry wage distribution (they got better jobs in their new industries); and 3) most receiving industries had substantially higher average wages than the Food and Beverage industry. The wage impacts for Food & Beverage trainees were positively larger than non-trainees because, compared to more highly skilled workers from manufacturing, for example, they had lower levels of human capital and therefore benefited more from job training services. Hotel & Motel workers were similarly situated and had similar experiences.

4.3.4.2.1. Non-LTU Workers

Table 4.28 summarizes the non-interacted and demographically interacted regression results which quantify the impacts of job training services on the quarterly wages of non-LTU workers. Non-LTU job training participants experienced a $50 premium over non-trainees on average. Several categories of job training services

showed positive impacts from training services: Intensive services ($23), Occupational Skills training ($240), On-the-Job-Training ($109), and Skills Upgrade training ($397). All regression coefficients for the non-interacted model were significant at the five percent level except for and Occupational Skills training and Mentoring which were significant at the ten percent level. These regression results show positive impacts in more training categories than for declining industries as a whole, the Manufacturing sector, and the Textiles industry.

The demographically interacted regression results show that non-LTU female trainees experienced larger wage impacts than female non-trainees: $92 quarterly. Positive quarterly wage impacts for female trainees were also in evidence for Occupational Skills training ($377), OJT ($231), Mentoring ($55), and Skills Upgrade training ($385). These regression results for the female demographic were significant at the 10 percent level. No statistically significant regression results were found for white racial identity.

On average, non-LTU participants receiving job training services experienced an adverse $19 quarterly wage impact for each year of additional age compared to non-participants. Young training participants experienced more severe wage impacts as a group, -$38 quarterly, than for middle age and older workers. Older participants showed positive wage impacts of additional age of $44 per quarter per year. The role of personal characteristics such as age may be more modest for this group.

These positive wage impacts for age for former Food and Beverage workers are counter to results for other industry sectors such as Manufacturing which uniformly showed negative impacts for additional years of age. For former Food and Beverage

workers, the wage benefits associated with job training were sustained and actually grew larger over time. In summary, not only were positive wage differentials found between former Food and Beverage workers after transition to a new industry, but positive wage differentials were also found between non-trainees and trainees. An important finding of this research was that GDOL job training services positively benefited former Food and Beverage trainees in a way not experienced by workers transitioning from most other declining industries.

4.3.4.2.2. LTU Workers

Table 4.29 presents the wage impact regression results for the LTU workers from the Food and Beverage industry. The overall non-interacted regression result for receipt of any job training service (JTR) was statistically insignificant. However, wage impacts for Core Services, Occupational Skills training, Remedial Skills training, OJT, Mentoring, and Skills Upgrade training were significant for trainees versus non-trainees. The wage impacts for LTU workers were generally smaller in magnitude than impacts for non-LTU trainees.

Quarterly wage impacts for LTU female trainees compared to female non-trainees averaged $39 per quarter. Impacts for Occupational Skills training, Remedial Services, OJT, and Skills Upgrade training and were $263, -$21, $283, and $56, respectively. The wage effects for LTU females were smaller than non-LTU females except for OJT which were $52 larger. The impact for Skills Upgrade training for LTU females compared to non-LTU females trainees was much less: $330. As with the non-LTU trainees, the wage impacts for white racial identity were statistically insignificant.

Most job training service categories were statistically insignificant for age effects on wages. The exceptions were Extended Job Search, and Skills Upgrade training which showed negative impacts per additional year of age. In contrast to young non-LTU trainees, young LTU trainees experienced more severe negative wage impacts for Extended Job Search Services and Skills Upgrade training. Similar to the non-LTU participants, older LTU trainees showed positive effects for additional years of age.

4.3.4.3. Effects of Job Training on the Duration-of-Unemployment

4.3.4.3.1. Non-LTU Workers

Table 4.30 presents the regression results for the time to reemploy dependent variable for the non-LTU worker population leaving the Food and Beverage industry. The non-interacted coefficient for job training shows that job training service participants required an additional 19.2 days to find stable employment compared to non-trainees. Comparable delays were also experienced by Occupational Skills, Remedial Services, and OJT participants. Workers receiving Extended Job Search Services and Skills Upgrade training had substantially longer periods of unemployment before finding stable work: 33.8 and 36.5 days.

Female trainees from the Food and Beverage industry found new stable work two weeks sooner than female non-trainees. Female Occupational Skills trainees also found work quicker, 23.7 days. However, females receiving Extended Job Search Services and Skills Upgrade training experienced a longer duration of unemployment. Regression coefficients for white racial identity were statistically insignificant except for Extended Job Search services which showed that recipients required almost two weeks longer to find stable work. Age-dependent job search time effects were statistically significant for

several categories but in no case were the results economically significant. On average, young workers experienced longer job search times and older workers slightly less.

4.3.4.3.2. LTU Workers

Table 4.31 summarizes the duration of job search dependent variable for workers leaving the Food and Beverage industry and experiencing long-term unemployment. On average, recipients of any job training service (JTR) required 27.4 days longer to find stable work compared to LTU non-trainees. Occupational Skills and OJT participants took 45.6 days longer to find new employment. Skills Upgrade trainees required 25.6 days longer to find work. Consistent with previous results, the LTU participants from the Food and Beverage industry experienced longer job search times than non-LTU participants.

On average, female trainees needed 12.8 days fewer days to find new stable work than female non-trainees. Females receiving Extended Job Search services and Skills Upgrade training required about two weeks longer to find a stable job. White trainees found work 24.6 days sooner than non-trainees on average (JTR). Overall, for each year of additional age, job trainees (JTR) required 5.5 fewer days to find a new stable job than non-trainees and recipients of Intensive Services took ten fewer days to find work. Younger workers experienced beneficial time effects from training services; saving Intensive Services recipients and Occupational Skills trainees about ten days. For older workers, the time effects from training were statistically in significant. The time effects associated with LTU workers receiving job training services.

Summarizing the time impacts from job training, older non-LTU participants from the Food and Beverage industries modestly reduced the amount of time spent on job

search in most significant training categories while younger LTU trainees benefited more than older trainees.

4.3.4.4. Job Training Service Cost-Effectiveness Analysis

4.3.4.4.1. Non-LTU Workers

The non-interacted regression results for the non-LTU workers from the Food and Beverage industry in Table 4.32 show that positive wage benefits were produced by three job services for which data were available: Intensive Services, Occupational Skills training and Skills Upgrade training. For Intensive Services, a five-year recovery period for wage benefits for trainees versus non-trainees produced a $406 benefit at a cost of $84 resulting in a calculated CE of 0.21. While the wage gains from Intensive Services were modest, $406 quarterly, the investment was small so the net benefit was positive. The wage benefit from Occupational Skills training, $4,160, were larger than for Intensive Services but these came at a much larger cost, $3,250, resulting in a smaller CER of 0.78. Because the CER was less than one, Occupational Skills training was a good investment but with a limited training budget, the Intensive Services was a better public investment based on the analytics. Skills Upgrade training also represented a beneficial investment with a CER of 0.25, about the same as for Intensive Services. However, compared to Intensive Services, Skills Upgrade training was more likely to provide the participant with the additional human capital necessary for long-term success in the job market and probably justified the additional cost of providing the service.

The cost-effectiveness analysis for female trainees indicated that Occupational Skills training (CER = 0.50) and Skills Upgrade training (CER = 0.26) generated net positive benefits for the investment. This result was consistent with the previous findings

of this and other research which showed that females generally benefited more from Occupational Skills, and most other training courses, than did males.

4.3.4.4.2. LTU Workers

The CE analysis for non-LTU population from the Food and Beverage industry, Table 4.33, provides measures of the relative value of the reduction in time required to find new work for trainees compared to non-trainees. The interacted regression results show that non-LTU female Occupational Skills trainees reduced the time required to find new stable work by an estimated $137 per day based on averaging the program cost over the days saved from receiving the training. No other non-LTU CER was available for comparison. For LTU whites, the shorter duration of unemployment that resulted from training accounted for $274 cost per day for Occupational Skills training and $119 for Skills Upgrade training. Comparatively, the smaller CER for Skills Upgrade training represents a better value in terms of the reduced number of days for trainees versus non-trainees.

Table 4.32. Cost Effectiveness Analysis, Wage Effects

Trainee Population	Demographic Factor	Job Training Service	Service Cost ($)	Wage Effect ($)	CER
Non-LTU					
	Non-Interacted	Intensive Services	$84	$406	0.21
		Occupational Skills	$3,250	$4,160	0.78
		Skills Upgrade	$1,735	$6,883	0.25
	Female	Occupational Skills	$3,250	$6,525	0.50
		Skills Upgrade	$1,735	$6,670	0.26
LTU					
	Non-Interacted	Occupational Skills	$3,250	$2,452	1.33
		Skills Upgrade	$1,735	$4,424	0.39
	Female	Occupational Skills	$3,250	$4,546	0.71
		Skills Upgrade	$1,735	$964	1.80

Table 4.33. Cost Effectiveness Analysis, Duration of Unemployment Effects

Trainee Population	Demographic Factor	Job Training Service	Service Cost ($)	Time Effect (Days)	CER
Non-LTU					
	Female	Occupational Skills	$3,250	23.7	$137
LTU					
	White	Occupational Skills	$3,250	11.9	$274
		Skills Upgrade	$1,735	14.6	$119

4.4. Urban-Rural (UR) Geographic Analysis

The urban-rural (UR) Continuum maps (see Figure 3.5) differences in population and proximity to urban areas onto a numeric scale between one and nine[20]. Regression Equation 3.6 was used to estimate the wage and duration of job search effects. With the GEO dummy independent variables set to the appropriate UR code for each client record, regression analysis was performed on the state-level dataset. Table 4.34 presents the results of the regression analysis using the wage dependent variable denominated in dollars, the job search time variable in terms of quarters, and the other control variables utilized in the statewide analysis. UR 1 was chosen as the dummy variable reference area. Except for UR 9 and the time dependent variable for UR 2, all geographical regression coefficients were found to be statistically significant.

Table 4.35 describes each of the UR areas linking the wage and time dependent variables to potential correlates such as population, unemployment status, per capita income, industry mix (the proportion of goods production in the local economies), and

[20] Note: For the state of Georgia, no area was coded with a value of five in the U.S. Department of Agriculture's urban-rural framework.

Table 4.34. Urban-Rural (UR) Wage and Job Search Time Dependent Variables

UR Code	UR Descriptor	Wage Difference ($) Coefficient	t-statistic	Job Search Time (quarters) Coefficient	t-statistic
1	Metro >= 1M	Reference		Reference	
2	Metro = 250,000 and < 1M	-83.96	-2.59	0.023	0.48
3	Metro < 250,000	-137.95	-5.65	0.120	2.41
4	Urb. Pop. > 20,000 adjacent to metro	-213.99	-6.29	0.300	4.29
6	Urb. Pop. > 2,500 to 19,999; adjacent to metro	-186.18	-2.03	0.492	5.73
7	Rural or Pop. 2,500 to 19,999; not adjacent to metro	-289.03	-1.65	0.646	8.00
8	Rural or Pop. < 2,500; adjacent to metro	-272.99	-2.72	0.567	3.78
9	Rural or Pop. < 2,500; not adjacent to metro	-159.68	-1.11	0.344	1.60

transportation-related factors, here proxied by the mean commute time for the UR area[21]. Pearson correlation coefficients were calculated between the dependent variables and the population, income, industry, and commute time datasets and, except for the mean commute times, were found to be high and statistically significant. Statistically insignificant regression results are shown in gray and not were included in the analysis.

4.4.1. Wage Impacts from Job Training

4.4.1.1. The Urban-Rural Continuum One (UR 1) Areas: Metros Greater than One Million Population

As noted previously, UR 1 had the largest population and the highest per capita income of all the UR areas. The largest declining industries in the UR 1 area were the

[21] Source: U.S. Census 2000 Summary File (SF 3): P1: Total Population; P43: Sex by Employment Status for Population 16 Years and Over; P82: Per Capita Income in 1999 (dollars); P49: Sex by Industry for the Employed Civilian Population 16 Years and Over and P31: Travel Time for Workers 16 and Over.

Table 4.35. Correlates to the Urban-Rural Continuum Dependent Variables

U-R Code	Wage Dependent Variable ($)	Time Dependent Variable (Qtrs.)	Population	Unemployment Rate	Per Capita Income ($)	Industry Mix (Proportion Goods)	Mean Commute Time (Minutes)
1	0.00	0.00	4,247,981	5.1%	24,785	0.203	33.0
2	-83.96	0.02	987,038	6.3%	18,909	0.240	24.3
3	-137.95	0.12	1,291,436	6.3%	17,988	0.291	23.5
4	-213.99	0.30	319,753	6.8%	16,360	0.292	21.6
6	-186.18	0.49	853,006	6.0%	15,709	0.420	25.5
7	-289.03	0.65	257,021	6.3%	14,469	0.434	23.3
8	-272.99	0.57	140,854	5.2%	15,601	0.420	29.7
9	-159.685	0.34	89,364	4.8%	16,250	0.418	26.8
Wage Correlation Coefficient			0.87*	-0.272	0.93**	-0.88**	0.44
Time Correlation Coefficient			-0.67***	0.023	-0.82***	0.97****	-0.19

* Significant at 0.05 level (2-tailed) ** Significant at 0.01 level (2-tailed) *** Significant at 0.05 level (1-tailed) **** Significant at .01 level (1-tailed)

Administration and Support, Computer and Electronic Manufacturing, Apparel Manufacturing, and Accommodations industries with a net 37,950 in job losses. UR 1 served as reference area for the regression analysis present in Table 4.34.

4.4.1.2. The Urban-Rural Continuum Two (UR 2) Areas: Metros 250,000-1 Million Population

The smallest wage differential for job training versus no job training was for UR 2 (the second most urbanized area in the state): $84 dollars per quarter less than the reference UR 1 area. Relative to the Atlanta region, the estimated wage differential for UR 2 areas, encompassing Savannah, Augusta, Columbus, and the northwest tip of the state, was small compared to the area per capita income (1.8 percent).

The largest employment losses in the UR 2 areas was the Textiles Mills industry, much of it located in the UR 2 areas in the northeast corner of the state in Walker, Dade and Catoosa counties and the Columbus (Muscogee County) area. The shift-share calculations revealed that UR 1 had lost large numbers of workers in service industries from local competitive effects during the study period while the Textile-related industries of the UR 2 areas were in steep decline nationally and in Georgia.

4.4.1.3. The Urban-Rural Continuum Three (UR 3) Areas: Metros Less Than 250,000

UR 3, the Rome-Dalton, Macon-Bibb County, Valdosta, Albany, and coastal areas including Brunswick, experienced a $138 negative wage differential for trainees compared to the UR 1 area. Unlike the UR 1 area, but similar to the UR 2 areas, the major job-losing industries in the UR 3 areas included Textiles Mills and Food and Beverage Stores.

Table 4.35 shows a mean commute time of 23.5 minutes in the UR 3 areas, 9.5 minutes (71.2 percent) less the UR 1 Atlanta area but only 0.8 minutes less than the UR 2 areas. This difference in average commute times is a factor both on the journey-to-work and the time necessary to travel to job training services. The UR 3 areas retain a distinctly urban character and share many labor market characteristics with the UR 1 and UR 2 areas including worker proximity to major employment centers, a result consistent with a modest wage differential. Per capita income in the UR 2 and UR 3 areas were also similar, only 5.1 percent different, lending support to the finding that similar UR areas experienced similar wage impacts from job training.

4.4.1.4. The Urban-Rural Continuum Four (UR 4) Areas: Population Greater than 20,000 and Adjacent to a Metro

The less urbanized UR 4 areas—Waycross, Saint Mary's, and Thomasville—experienced a larger adverse wage impact, $214 compared to the reference UR 1 metropolitan Atlanta area. Table 4.3 showed that compared to the UR 3 areas, the UR 4 area job losses were more concentrated in the manufacturing sector. The mean travel time experienced by workers was only 21.6 minutes, the least of any UR area.

4.4.1.5. The Urban-Rural Continuum Six (UR 6) Areas: Population 2,500--20,000; Not Adjacent to a Metro

The UR 6 and the other comparatively more rural URs consistently had lower per capital incomes, a higher proportion of goods producing industries, and shorter mean commute times than the more urbanized UR areas 1 through 4. In UR 6, two of the three top job–losing industries were in the Textiles sector, a finding consistent with the areas' large proportion of goods producing industries (0.420). The UR 6 areas, which include

Bainbridge and Cairo, Americus, Cartersville, and numerous other small cities, departed somewhat from the pattern of wage differentials between trained and untrained workers increasing with rurality; only $186 less for trainees compared to non-trainees. It is possible that the UR 6 areas, while disbenefiting from the decline of the goods-producing sector, still retain enough of a diversified economy to offer alternative employment to job trainees when they seek re-employment.

4.4.1.6. The Urban-Rural Continuum Seven, Eight, and Nine (UR 7, 8, and 9) Areas: Population 2,500-20,000 Not Adjacent to a Metro (UR 7); Rural Less Than 2,500 and Adjacent to a Metro (UR 8) or Not (UR 9)

The UR areas 7 and 8, consisting of smaller municipalities, continued the pattern of increased wage differentials with increased rurality, $289 and $272, respectively. The UR 7 area geographical variable coefficient was found to be of lower statistical significance, however, with a t-value of -1.65, just above the 10-percent level for a 2-tailed test. The UR 7 areas had the highest proportion of goods-producing industries, 0.434, of any of the UR areas. UR 7 also had a high average commute time of 23.3 minutes with UR 8 the highest of the rural areas, 29.7 minutes, closest to the UR 1 commute time. The most rural of the UR areas, UR 9, had a statistically insignificant wage differential with a t-value of -1.11. Per capita income for UR 7 and 8 were the lowest in the state.

4.4.2. Job Search Time Impacts from Job Training

Similar to the wage results, the regression coefficients for the UR geographies also trended toward longer job search times for increasingly ruralized areas in the state. Using the Atlanta area as a reference, the job search time coefficient estimates showed an

increase of 2.1 days for UR 2 up to 58.9 days longer for the UR 7 areas. The exception was the UR 8 areas, which showed that job trainees experienced a much longer job search time of 51.7 days. Higher transportation costs for the rural areas compared to the mid-sized UR areas may be an important explanatory factor. Similar to the wage impact analysis, only UR 9 had statistically insignificant results.

4.4.3. Discussion of Wage and Job Search Time Impacts from Job Training

Though causality cannot be inferred from Table 4.35, there appears to be a strong positive relationship between the wage dependent variable and population (0.87) and per capital income (0.93) and a strong inverse relationship between the wage dependent variable and industry mix (-0.88). The higher the income in a UR, the more likely it was to be urban. The higher the proportion of goods-producing industries, the more likely the UR was rural. A significant inverse relationship was found between the job search time dependent variable and population (-0.67) and per capita income (-0.82) and a strong positive relationship between the job search time dependent variable and industry mix (0.97). The higher the per capita income in a UR, the more likely it was that job search times were relatively shorter. The higher the proportion of goods-producing industries, as in rural areas, the more likely job search times were longer. The level of unemployment or mean commute time in a UR was not found to be significantly correlated with the either the wage or job search time dependent variables.

The per capita income and industry mix data in Table 4.35 tended to change monotonically with increasing rurality but the mean commute time data were concave up, suggesting that the longest commutes were for the highly populated urban areas with high levels of traffic congestion and the most rural areas which suffered from long distances

that must be traveled during the journey-to-work and shopping. Conclusions based on commute times were therefore more difficult to justify.

As a general finding, the regression-estimated wage and time impacts revealed a definite geographic pattern in which the more rural areas experienced larger negative wage differentials upon re-employment and longer job search times for job trainees compared to non-trainees. The importance of "people vs. place" is a recurrent discussion within the field of planning and concerns designing public policies to aid persons and places that are economically depressed (Bolton 1999). The relevance of the "people vs. place" debate is important to considerations of how to spend scarce job training service dollars. The greatest need for these services is in the rural areas where job opportunities are less plentiful than the urban areas.

As noted earlier in this chapter, central place theory suggests that more varied job opportunities are present in urban areas, a result of the larger diversity of economic activities, which may lead to significantly different impacts from job training services on the wage differences and job search times for job training participants in rural areas versus non-participants. The finding that the manufacturing-oriented rural areas, as demonstrated by the higher proportion of goods-producing industries there, experienced larger adverse wage and job search time impacts from job training compared to the urban areas, is consistent with the idea that centrality, and the diverse employment possibilities outside the manufacturing sector in the economically more diverse urban areas, is an important explanatory factor for these wage and job search time differences. The diversity of employment possibilities in the urban URs, rather than the level of

unemployment, is more likely to positively affect the wage and job search time experience of trained versus untrained workers.

4.5. Workforce Investment Area (WIA) Geographic Analysis

Georgia's WIAs are a diverse group of geographies ranging from the county-size urban WIAs of Atlanta to the rural WIAs encompassing over a dozen counties (Figure 3.8). Georgia has twenty WIA service areas each with at least one full-service One-Stop Center from which a range of workforce services, including job training, are made available. The Georgia WIA job training system builds on the system of workforce development services currently provided through the state's technical colleges and the GDOL One-Stop Career locations, local WIA programs, and vocational rehabilitation services (GDOL 2004). Despite uniform program requirements emanating from the Workforce Investment Act legislation and U.S. Department of Labor, important differences in job training program function and effectiveness may exist due to administrative factors internal to the WIAs and beyond the scope of the current research.

Unlike the Urban-Rural Continuum, which varies from one to nine in descending order of population size and proximity to urban areas, the WIAs are arbitrarily numbered beginning with Northwest Georgia as WIA 1 and ending with WIA 20 in coastal Georgia in the southeast (Table 4.36). Generalizations that were possible with the UR scheme—for example, the proportion of goods producing industries increases with the UR code—were not possible with the WIA codes because of their origin as administrative, not socio-economic, areas. The regression coefficients for the WIAs were all statistically significant except for the Cobb County (wage) and Macon-Bibb, Middle Georgia, and

Table 4.36. Workforce Investment Area (WIA) Wage and Job Search Time Dependent Variables

WIA Code	Workforce Investment Area Descriptor	Wage Difference ($)		Job Search Time (quarters)	
		Coefficient	t-statistic	Coefficient	t-statistic
1	Northwest Georgia	-267.95	-10.60	0.52	9.20
2	Georgia Mountains	-286.87	-6.47	0.16	2.18
3	City of Atlanta & Fulton County	Reference		Reference	
4	Cobb County	-55.02	-1.35	-0.12	-1.89
5	DeKalb County	-119.70	-2.88	-0.17	-2.52
7	Atlanta Regional	-145.86	-8.08	0.04	0.85
8	West Central Georgia	-213.76	-7.49	0.74	10.96
9	Northeast Georgia	-183.03	-6.14	0.44	5.90
10	Macon-Bibb	-269.71	-5.37	-0.02	-0.21
11	Middle Georgia	-185.74	-3.36	0.01	0.16
12	Richmond/Burke Counties	-148.61	-2.17	-0.11	-1.28
13	East Central Georgia	-190.68	-3.34	0.49	4.55
14	Lower Chattahoochee	-286.90	-6.16	0.48	6.31
15	Middle Flint	-205.28	-3.68	0.70	6.00
16	Heart of Georgia Altamaha	-228.47	-2.63	0.55	6.90
17	Southwest Georgia	-239.77	-6.19	0.24	3.88
18	South Georgia	-235.91	-4.86	0.20	2.50
19	Southeast Georgia	-270.49	-6.04	0.30	3.00
20	Coastal	-195.03	-6.10	-0.16	-2.82

Richmond-Burke Counties (time). WIA 3, the City of Atlanta, was selected as the reference WIA.

Table 4.37 links the wage and time dependent variables of each of the WIA areas to the same potential correlates as used in the UR geographic analysis. Pearson correlation coefficients were calculated and, except for unemployment and the mean commute time for the time dependent variable, were found to be statistically significant. As before, the statistically insignificant regression results are shown in gray and not included in the correlation analyses.

4.5.1. Wage Impacts from Job Training

The more populous WIAs—City of Atlanta and Fulton County (reference), Cobb County (-$55), DeKalb County (-$120), and the Atlanta Regional (-$146)—are all located in the Atlanta region and as a group had smaller wage and job search time coefficients than the more rural WIAs. Workers receiving job training services in these urban WIAs experienced relatively small adverse wage impacts compared to non-trainees. This finding was consistent with the results of the urban-rural continuum regression analysis and supported the notion of the Atlanta region as a single contiguous and homogenous labor market.

The most northern WIAs—Northwest Georgia and Georgia Mountains—had comparable negative wage impacts associated with job training, about $275 per quarter. Employment impacts in Northwest WIA were due to the Textiles industry and the broader manufacturing sector in Mountains WIA. Most of the rural WIAs, from the fall line in the central part of the state south to the Florida and Alabama borders, experienced large negative wage impacts associated with job training compared to the urban regions.

The Lower Chattahoochee, Heart of Georgia, Southwest Georgia, South Georgia, and Southeast Georgia WIAs averaged a negative wage impact of $252 for trainees compared to non-trainees. The prevalence of manufacturing firms and employment decline in the Food and Beverage and General Merchandise industries in the rural WIAs made job seeking more difficult. Consistent with the UR analysis, the rurality of these WIAs contributed to this difference.

WIAs with comparatively moderate negative wage impacts from job training—Northeast Georgia (-$183), Middle Georgia (-$186), and East Central Georgia (-$191)—were located in moderately rural areas of central Georgia with good access to the larger urban centers. The wage coefficient for the Coastal WIA, which includes Savannah and Brunswick, was -$195, also smaller than the more rural areas in the state.

4.5.2. Job Search Time Impacts from Job Training

The metropolitan Atlanta WIAs showed comparably modest job search impacts from the receipt of job training services, averaging about 14 days. The Cobb County and DeKalb County WIAs actually evidenced small but positive time impacts from job training, eleven and fifteen days shorter than for the reference City of Atlanta WIA, respectively. Trained job seekers in the Coastal WIA also had shorter job search times, about 17.7 days less than the Atlanta WIA.

The most northern WIAs—Northwest Georgia and Georgia Mountains—showed comparable negative wage impacts from training but the job search time impacts for Northwest was 325 percent greater, a possible result of the decline of the Textiles industry located in that WIA and the relative difficulty in finding new work there once trained.

Trained job seekers in the more rural WIAs in the central and southern parts of Georgia--East Central Georgia, Lower Chattahoochee, Middle Flint, Heart of Georgia, Southwest Georgia, South Georgia and Southeast Georgia--required on average of 38 more days to find new work than trainees in the reference WIA. Middle Flint WIA trainees had the most adverse time impact of 64 days more spent in job search than in the reference WIA 3, the city of Atlanta. The job search time regression coefficients were statistically insignificant for the Macon-Bibb, Middle Georgia (suburbs of Macon), and Richmond-Burke County WIAs, each occupying levels two or three in the urban-rural continuum.

4.5.3. Discussion of Wage and Job Search Time Impacts from Job Training

Table 4.37 summarizes the correlations between the wage and job search time dependent variables using the same population, per capita income, industry mix, and mean commute time variables already presented in the UR analysis. With the exception of the correlations between the dependent variables and the unemployment rate data, the other variables-- income, industry mix, and commute time--were determined to be statistically significant at the 0.05 level or higher for the wage dependent variable. The mean commute and population variables were not found to be significant for the job search time variable

The modest wage impacts for trainees in the Atlanta area WIAs, 3 through 7, were associated with low unemployment, high per capita income, a low proportion of goods-producing industries, and high commute times. The comparatively higher wage impacts for the WIAs in the rural areas were associated with higher unemployment, lower income, more goods production, and, often, lower commute times. The WIA-level

results, therefore, were found to be generally consistent with the UR results. Similarly, the time required for new trainees to find new work in the urban WIAs was shorter than in the rural WIAs.

In summary, considering the wage and job search time impacts for job trainees by WIA, the pattern that emerges is very similar to the urban-rural analysis. The single most determining factor for the dependent variables is the degree of urbanity-rurality of the WIA. As such, the WIA-level analysis added comparatively little to the research results. Due to the greater spatial resolution of the WIAs compared to the UR areas, the -$84 wage impact for trainees in UR 1 decomposed into a -$55 impact for Cobb County and a -$146 impact for the Atlanta Regional WIA. While these results are mutually consistent, they did not change the result of the UR analysis. Similarly for the time analysis, the more rural WIAs were found to have longer job search times, a finding consistent with the UR analysis. Thus, the most significant results of the geographic analyses were to found in the UR analysis, a reflection of the importance of the degree of urbanity and the consequent size and diversity of local labor markets in which trainees must seek new work.

Table 4.37. Correlates to the Workforce Investment Area Dependent Variables

WIA Code	Wage Dependent Variable ($)	Time Dependent Variable (Qtrs.)	Population	Unemployment Rate (%)	Per Capita Income ($)	Industry Mix (Proportion Goods)	Mean Commute Time (Minutes)
1	-267.95	0.52	697,410	4.2%	17,673	0.40	28.7
2	-286.87	0.16	455,342	3.5%	20,824	0.36	29.1
3	0.00	0.00	816,006	8.9%	30,003	0.14	30.4
4	-55.02	-0.12	607,751	3.8%	27,863	0.18	33.2
6	-119.70	-0.17	665,865	5.5%	23,968	0.15	33.1
7	-145.86	0.04	1,339,757	3.6%	23,484	0.21	33.9
8	-213.76	0.74	403,944	5.1%	18,186	0.33	29.1
9	-183.03	0.44	423,417	5.7%	18,550	0.32	28.5
10	-269.71	-0.02	153,887	7.5%	19,058	0.19	23.1
11	-185.74	0.01	286,234	5.8%	18,101	0.27	24.4
12	-148.61	-0.11	222,018	9.2%	16,692	0.21	23.5
13	-190.68	0.49	217,489	7.0%	18,310	0.33	26.9
14	-286.90	0.48	250,364	6.8%	17,931	0.24	21.9
15	-205.28	0.70	116,997	7.0%	14,870	0.40	23.1
16	-228.47	0.55	272,894	5.6%	14,568	0.40	25.1
17	-239.77	0.24	352,880	7.4%	15,678	0.35	22.6
18	-235.91	0.20	226,892	5.9%	15,741	0.33	20.7
19	-270.49	0.30	138,033	5.6%	14,301	0.40	24.5
20	-195.03	-0.16	539,273	6.5%	19,005	0.22	24.3
Wage Correlation Coefficient			0.50*	0.185	0.79**	-0.66**	0.59**
Time Correlation Coefficient			-0.37	-0.107	-0.54***	0.77***	-0.23

* Significant at 0.05 level (2-tailed) ** Significant at 0.01 level (2-tailed) *** Significant at 0.01 level (1-tailed)

CHAPTER 5

CONCLUSIONS AND POLICY RECOMMENDATIONS

5.1 Summary and Conclusions

5.1 Georgia's Structurally Declining Industries

The state-level industry employment analysis indicated that sixteen of nineteen industry sectors in Georgia experienced employment growth during the five-year 1999-2003 study period of this research, a reflection of a strong state economy. Five of these sectors, mainly services, accounted for three-fourths the of total employment growth in the state. But only two of the nineteen sectors—Manufacturing and Administration and Support Services—accounted for 99 percent of the total net employment loss. Such concentrated employment loss, particularly at the state level, is indicative of structural change in these industries.

The state-level shift-share analysis revealed that the largest sources of employment decline in Georgia during the study period were attributable to industry mix factors, reflective of the structural changes in the nation as a whole. By far, the manufacturing super-sector led other industry groups in terms of net job losses with Textiles and the Apparel industries the most prominent. Georgia lost manufacturing jobs for two reasons: the U.S. gained productive efficiency in manufacturing, squeezing out labor in the production process, while losing market share to foreign competitors. Local competitive shift-share effects were found to be the dominant source of job losses in the Administration and Support Services, Accommodations, and retail industries. The causes of these employment losses were due to a combination of factors: shedding workers due

to slackening demand, regional improvements in productivity and economies of scale, and the increasing presence of large, cost-efficient retailers.

The Urban-Rural (UR) Continuum shift-share analysis indicated different sources of structural change for different industry sectors in different geographic areas: services and retail in the urban UR areas; manufacturing and retail in most of the rural UR areas. Each of these UR areas had distinct unemployed worker populations with different training needs. This diversity of the worker population had important implications for which training services the GDOL should provide and where and how they should provide them. This research concludes that for local factor job losses from competitive effects, mostly in services, retraining for work in new sectors may be less useful than re-connecting job-losers to other service jobs, either regionally or via worker mobility strategies. For manufacturing workers, retraining in that sector may not be a useful option because of industry shifts that mean the jobs will not return. Given the reluctance of many workers to relocate, retraining for new industries will only be effective if the occupations trained for are those demanded by local industries.

5.1 GDOL Job Training Service Impacts

The most critical question addressed by this research was whether GDOL job training services were effective at alleviating the adverse effects of structural employment. The short answer is a qualified yes, at least for some demographic groups in some industries. But overall, GDOL training services were found to be ineffective at raising the wages or shortening the length of job search of the average trainee over non-trainees, at least for structurally declining industries. Of the non-long-term unemployed (non-LTU) participants leaving the identified declining industries, 4.1 percent received

GDOL job training services experiencing, on average, an estimated wage loss of $172 per quarter for trained versus non-trained workers. The question arises of why trainees on average did less well than non-trainees. It seems implausible that GDOL job training services actually lowered trainee wages. When exiting a structurally declining industry, some workers landed on their feet but others did not. Consistent with much of the job training literature, this research suggests that worker personal characteristics played an important role in post-training outcomes.

However, these average results masked a more nuanced situation that is far more interesting and significant to both potential trainees and workforce development system policymakers. The effectiveness of GDOL job training services was found to vary significantly on several dimensions: trainee demographics, the type of job training service received, whether the trainee lived in an urban or rural area, and the industries the structurally unemployed workers left.

The Core, Intensive, and Occupational Skills training service categories, associated with the walk-in services provided by each of the GDOL One-stop Centers and involving initial job search assistance, résumé preparation, and interviewing and "life" skills instruction, mostly evidenced negative wage effects. However, Skills Upgrade trainees experienced positive wage effects, especially for females, which is especially important because that category most directly involves the traditional areas of job training focused on higher-paying assembly line skills.

Of the long-term unemployed (LTU) participants leaving the identified declining industries, 12.2 percent received GDOL job training services. These data indicate that proportionately three times as many LTU job training participants elected job training

services compared to non-LTU workers. Workers experiencing LTU were more likely to use job training services but the average effect of job training services for the long-term unemployed was near zero and statistically insignificant. No conclusions regarding wage impacts on LTU trainees can be inferred from this result but the economic significance was low at best. This is a disappointing result for the long-term and structurally unemployed workers looking to regain their foothold in the mainstream economy.

It was also determined that GDOL job training services for non-LTU and LTU participants actually increased the time the average trainee devoted to job search. Although job training requires a time investment on the part of trainees, ideally the cost is outweighed by increased desirability once on the job market which potentially lessens the time spent in job search. On average, for trainees quickly re-employed after leaving a declining industry, job training services was associated with about five additional days to the time required to become re-employed compared to non-trainees. In part, this may be due to the time required to receive most job training services, especially those requiring a lengthy program of study such as Skills Upgrade training. On average, LTU trainees required a full month more time to find new work. Again, the role of worker personal characteristics may have played an important role in the lengthy job search.

The cost effectiveness analysis (CEA) was the primary means by which the central research question of this research—Which GDOL Training Programs are most effective at alleviating structural unemployment, and why?--was answered. Even if positive wage impacts were in evidence, the question to be addressed is which training service categories best offset the public investment in training. Among other findings for declining industries as a group, the CEA demonstrated that while Skills Upgrade training

yielded significantly larger wage impacts, the higher program costs made the relatively less costly Intensive services more efficient for provision of services to more participants under stringent budget constraints. Skills Upgrade training had an especially large effect on the wages of females. The positive impact of Skills Upgrade training is important because that program most directly involves the traditional areas of job training associated with relatively well-compensated factory skills. But the positive wage impacts of Skills Upgrade training were much larger for non-LTU compared to LTU trainees; those more likely to experience structural unemployment.

The retraining of workers transitioning from the structurally declining manufacturing super-sector is especially important because their wages have historically been the foundation of many local economies throughout the state of Georgia. Unfortunately, the average wage impact for trainees leaving declining manufacturing industries was virtually identical to the average wage impact for declining industries as a group. Evidently, the average impact of job training services on wages for former manufacturing workers was insufficient to raise their level of human capital enough to improve trainee wages over non-trainees. Many workers faced lower wages when leaving a depressed sector and moving to a new line of work, but the "last hired, first fired," particularly the long-term unemployed, were more likely to seek job training services as a last resort because of personal characteristics that may have adversely influence their desirability to employers.

Skills Upgrade training for non-LTU manufacturing industry leavers had a substantial positive impact on quarterly wages. This finding supports the idea that some workers exiting the manufacturing sector were looking to re-train for another

manufacturing skill area. Unfortunately, relatively few of these workers actually participated in Skills Upgrade training, a result of funding constraints for this type of training versus the relatively inexpensive walk-in Core and Intensive informational services. Skills Upgrade training was provided by a network of educational service providers, most in the for-profit private sector, at a much higher cost than the informational services provided at the GDOL One-stop Shops. For LTU trainees from manufacturing, the average wage impact was negative and, for Skills Upgrade trainees, statistically insignificant. The cost-effectiveness analysis for manufacturing trainees was similar to the declining industry population. Skills Upgrade training produced the largest wage gains over the five-year evaluation horizon, but at a higher cost than for Intensive Services and Occupational Skills training.

Important exceptions to the pattern of adverse wage impacts from job training were found in the Food & Beverage and Hotels and Motels industries. During the study period, workers left the Food and Beverage industry in numbers comparable to the numbers leaving the Administration and Support Services and Textile industries. Many of these former Food & Beverage workers found stable new employment in industries with higher average wages and trainees earned a premium over non-trainees. Compared to workers from Georgia's declining industries and the manufacturing industries as a super-sector, workers exiting the Food and Beverage industry and receiving GDOL job training services substantially improved their wages.

Both non-LTU and LTU Food and Beverage trainees benefited from Intensive Services, Occupational Skills, and Skills Upgrade training. Similar to workers from other industries, Intensive Services for Food & Beverage trainees was the most efficient public

investment based on the analytics. But compared to Intensive Services, Skills Upgrade training was more likely to provide the participant with the additional human capital necessary for long-term success in the job market and justifies the additional cost of providing the training under less stringent budget constraints.

Most Food and Beverage workers found higher wages in their new industries because, pre-transition, they were among the lowest paid employees in that industry (wages were skewed toward the bottom of the wage distribution); their post-transition wages were often higher in their new industry wage distribution; and the industries to which they transitioned had higher wages on average. Food & Beverage trainees benefited more from job training services because, compared to more highly-skilled workers from other industries, they initially had lower levels of human capital so training had a larger impact on worker skills and wages. Hotel & Motel workers had comparable experiences as Food & Beverage workers with respect to pre- and post-wage wage impacts from job training services. While the notion of re-training structurally unemployed workers from manufacturing for jobs in new fields at comparable pay is appealing, this research concludes that GDOL job training services were more likely to improve the wages of workers in low-skill, low-wage jobs that require little human capital.

This research found a definite geographic pattern in which trainees in rural areas experienced larger negative wage differentials upon re-employment and longer job search times compared to non-trainees. Economic theory predicts more varied job opportunities in urban areas, a function of the wider diversity of economic activities including employment. The finding that the goods-producing, mostly manufacturing, rural areas

had larger adverse wage and job search time impacts from job training compared to the more service oriented urban areas is consistent with the idea that centrality, and the diverse employment possibilities outside the goods-producing sector, is an important explanatory factor for these wage and job search time differences. The diversity of employment possibilities in the urban URs is more likely to positively affect the wage and job search time experience of trained versus untrained workers. With a larger number and variety of available jobs, workers in the urban areas were more likely to find work that rewards their training experiences. This research concludes that rural workers are at a disadvantage with respect to the benefits of job training services on wages and the time spent in job search.

The research findings show that for certain demographic groups, females primarily, and certain training services, Intensive Services and Skills Upgrade training, GDOL job services were of net benefit to trainees and the public. It was also determined that GDOL job training services were beneficial to workers leaving certain industries but not others. A very significant finding was that job training is, on average, ineffective at raising the wages of workers leaving the manufacturing sector but trainees from other industry sectors, particularly retail and the services sector, often experienced positive effects from job training services. In conclusion, GDOL job training services did not benefit all workers, particularly skilled workers from declining industries such as manufacturing, but were clearly beneficial to lower-skilled workers from the less well-paid service industries.

5.2 Policy Recommendations and Directions for Future Research

5.2.1. Policy Recommendations

Policy Recommendation 1. The GDOL should work with state and local agencies to strengthen social service networks and provide other support to parents utilizing job training services and, once a job is secured, assist them in maintaining that employment to provide job stability and economic security for their families.

One of the major findings of this research was that GDOL job training services were often more effective for raising the wages and reducing job search times of females compared to males. Within budget constraints, the GDOL is obligated to provide services to applicants for job training services independent of their demographic characteristics. However, it is recognized that females often have special barriers to obtaining job training services, finding employment, and maintaining employment. The GDOL should work with existing social service agencies and employers to alleviate the special burdens of parenthood which often fall disproportionately on females including access to child care, family medical services, and assistance with transportation and housing services.

Policy Recommendation 2. The GDOL and employers should consider special job training services and other individualized assistance for unemployed workers experiencing unusual difficulty in reconnecting to the workforce.

This research suggests that the personal characteristics of workers play an important role in wage impacts and the duration of job search resulting from training.

The findings have shown that the long-term and structurally unemployed do not benefit from job training services as much as shorter-term unemployed workers. Better definition of the specific trainee characteristics that influence their desirability to employers is needed as well as programmatic strategies that minimize the importance of these personal factors. The GDOL should systematically collect and analyze more comprehensive personal demographic and work history data to design special programs and training tracks for this worker population.

The labor market includes a large number of workers who cycle in and out of the job market, often with limited education. Many of these workers are often under-employed, unemployed, or persons transitioning from welfare to work. To improve the career advancement opportunities for hard-to-employ workers, Georgia's One-Stop Shops should consider sponsoring or facilitating training and education opportunities that are sufficiently flexible, accessible, and meet the short-term time horizons of lower-paid workers. Policymakers may want to incorporate job retention and career advancement strategies into job preparation, job search, and job training programs. Employers can also play a role in improving career advancement opportunities or accessibility of training for workers by allowing them to attend training during work hours or to make up lost work hours and, once employed, providing them with flexible schedules.

Additionally, the demand for the occupations that are projected to grow most quickly varies across the Georgia's twenty WIAs and it is recognized that not all future jobs will require a high level of employee skill. Most high-growth occupations require only a brief period of on-the-job training. While these jobs generally have lower wages than higher-skilled jobs, areas experiencing layoffs and other structural dislocations

should assess these occupations as short-term opportunities for unemployed or dislocated workers while they continue to search for better paying employment opportunities or receive new training.

Policy Recommendation 3. The GDOL should investigate why older job training participants from lower-skill industries do not exhibit the negative wage effects experienced by workers from more higher-skilled industries.

This research determined that, on average for workers leaving declining industries, a negative wage gap exists between trainees and non-trainees which grows with increasing age (trainees earn progressively less). The probable cause of the wage gap is personal factors beyond the scope of the present research. The wage gap for trainees at the extremes of the age spectrum—less than 24 or more than 54 years of age—is especially severe. Once trainees fall behind non-trainees in wage earnings, they seldom catch up. However, for lower-skilled industries such as Hotels & Motels, Food & Beverage Stores, and General Merchandise Stores, the wage gap for older workers is smaller and often positive. The GDOL should conduct research to understand why workers leaving industries requiring fewer skills show positive wage effects from increasing age.

Policy Recommendation 4. Consider funding GDOL job training service, in particular Skills Upgrade training, at the level necessary to make a difference to structurally unemployed, and other, workers.

This research found that while Intensive Services often proved to be the most cost-efficient service in terms of public expenditures, the Skills Upgrade track had larger positive wage impacts and therefore were more beneficial to the trainees in the long run. In a restricted funding environment, it is reasonable from a policy perspective to place resources where they will do the greatest good for the largest number of participants. However, short funding the Skills Upgrade training tracks does not provide an optimum outcome for either the potential trainees or the employers needing skilled workers. Policymakers should consider increasing funding levels for Skills Upgrade training.

Policy Recommendation 5. The GDOL should investigate why workers in temporary services do not significantly benefit from job training services. Depending on the findings of this investigation, policies could be devised which assist temporary help workers who desire more permanent and remunerative employment.

The manufacturing sector aside, the Administrative and Support (Temporary Help Supply) Services industry had the largest net job losses over the 1999-2003 study period. Although non-long-term unemployed workers from this declining sector sought job training services in above-average numbers, the regression results were statistically insignificant, making any quantitative conclusions impossible and reflecting no positive benefits to this worker population. For reasons not well understood, long-term unemployed workers from this sector chose job training services at less than half the average rate, however.

Workers leaving the Help Supply industry transition to a variety of industries including telecommunications, insurance, government, management services, and

hospitals. Given the heterogeneous composition and work experiences of this group, which segments would preferentially benefit from job training services and why is an important question. Temporary workers should be the focus of more research to determine the why GDOL job services are not more effective for this important worker population, especially the long-term unemployed.

Policy Recommendation 6. Consider more place-, industry-, or occupation-specific sectoral training strategies to take advantage of the skills of experienced, but currently unemployed, workers to provide them with new job opportunities.

Sectoral training strategies, sometimes called industry-specific or targeted strategies, involve occupation-specific training and are often offered by a particular employer or group of employers in a specific geographical area. Sectoral approaches to job training can be of particular interest to structurally unemployed workers leaving declining industries. Sectoral strategies are most often associated with low-income workers but are potentially useful as a broader strategy to alleviate structural unemployment. Workers transitioning from one declining industry in a geographical area could be matched with another industry in the same or a different area with similar occupational requirements and, with a minimum of re-training or job search assistance, quickly be ready for new work. Thus, sectoral approaches to job training have the promise of efficiently transitioning workers from declining to growing industries.

The success of sectoral strategies depends on collaborations among employers and job training service providers who are informed about the industry and workforce trends in specific geographical areas. The GDOL, and its twenty WIA offices, are in a

unique position to initiate and maintain sectoral collaborations among these actors because of their knowledge of regional Georgia's labor markets and the needs of the workers and employers in them.

Policy Recommendation 7. Consider providing financial and other incentives to existing and new service sector firms in Georgia that can bring jobs to workers in rural areas.

One of the major findings of this research was that the Urban-Rural Continuum geography explained much of the variability of wage differentials between trainees and non-trainees. Trainees in rural areas showed comparatively larger negative impacts on wages and job search times than trainees in urban areas. Additionally, Georgia's rural areas currently have a limited ability to absorb significant numbers of long-term or structurally unemployed workers. As the research indicated, Georgia's rural areas had more goods-producing employment, particularly in the manufacturing sector, than the urban areas in the state. With increasing competition from offshore factories, manufacturing jobs are unlikely to return to the rural areas. Unfortunately, the state's rural areas are currently lacking the higher-paying, higher-skilled service industries necessary to compensate for the job losses in the manufacturing sector. The focus would not be on local-serving service firms but those with regional, national, or international markets. The GDOL and state economic development agencies should consider devising financial and non-financial incentives to attract these firms to rural areas to provide jobs where they are badly needed.

Policy Recommendation 8. Consider providing support to structurally unemployed workers in rural areas to move to areas where there are more jobs.

As noted, Georgia's rural areas have a limited ability to absorb significant numbers of structurally unemployed workers. Some unemployed workers in rural areas will take the initiative to relocate to other areas of the state and nation where jobs are more plentiful. However, many rural workers have strong attachments to where they reside, either because they were born there or desire to live near friends or relatives.

A mobility strategy could provide support to encourage long-term and structurally unemployed workers residing in rural areas to relocate. The individualized incentives to promote worker mobility might include: labor market information attuned to their particular circumstances such as their previous industry and occupational experiences; information regarding how their family needs could be satisfied in a new location such as access to a high quality education for their children and affordable housing; and direct financial support for a move to an area with more or better jobs. Increased knowledge of the potential positive effects of a move, coupled with easing worker concerns about the potential downside of a move, could encourage workers to relocate when they might otherwise not. The opposite of a "One Georgia" strategy which seeks to lessen the stark disparities between the state's urban and rural areas, this politically unpalatable approach would give the rural unemployed real hope for "good" jobs.

Policy Recommendation 9. The GDOL should consider improving the medium for communicating labor market information to structurally unemployed and other workers.

The current GDOL website is an excellent source of labor market information including job search listings, assistance to employers, industry employment, employment, unemployment, historical, and other useful information[22]. However, this information is often not user-friendly and of limited use to many unemployed workers and especially to the long-term unemployed and structurally unemployed workers.

A more useful website to the long-term and structurally unemployed would provide information about job opportunities in other job markets, both in and out-of state. The GDOL should consider working with other state governments and employers to compile and make available national listings of job opportunities and related labor market information to unemployed workers. Detailed information about job opportunities and relocation logistics to other areas should be made available. The website should include blogs on which workforce participants and employers can directly exchange their personal experiences of unemployment without intermediation and how to best address the issues of job search, relocation, new employers, and familial and community issues.

Policy Recommendation 10. Consider improving the GDOL accounting procedures used to collect cost data for specific job training services.

Based on contacts with several WIAs during the study period, the WIAs did not systematically segregate cost accounting data by job training service program or report the cost of providing specific job training services to individual trainees. This research interviewed personnel at the Atlanta Regional WIA and, via phone, the Cobb, DeKalb, Heart of Georgia, Lower Chattahoochee, and Burke/Richmond WIAs. Except for the

[22] Retrieved from GDOL website URL http://www.dol.state.ga.us on March 29, 2008.

Atlanta Regional WIA, no program cost data was said to be available. The WIAs tracked costs by program source (Adult & Youth, Dislocated Workers, Trade Adjustment Act, Title II and III, etc.) and not by the specific job training service rendered. The orientation of the accounting procedures is focused on the upstream reporting requirements to the USDOL and not on improving the design of existing programs. This method of accounting does not allow the identification of how much is spent on each training service. This comingling of what should be segregated funding streams frustrates any attempt to understand which job training services are most effective at raising trainee wages. The unbusinesslike approach to program management does not adequately serve workers receiving job training services or Georgia's taxpayers.

Walk-in services, such as the bottom-tier Core and Intensive Services that most participants use, and second tier services such as Occupational Skills training, are provided by the full-time staffs of the GDOL One-Stop Shops without a detailed count of the number of persons served or the specific services provided. This unmetered access to job training services eliminates expense of the paperwork and tracking of each person served but greatly hinders any assessment of the effectiveness and efficiency of the services provided. Accurate counts of participants by job training service should be collected and analyzed with cost data to assess program effectiveness.

Policy Recommendation 11. The GDOL should consider improving the program information management systems necessary to ensure proper functioning of job training services.

Accounting systems are one element of a larger set of tools of interconnected tools, including planning, budgeting, and the performance tracking functions required to effectively manage a complex program such as state job training services. Under the current GDOL management approach, federal funding streams are budgeted to the One-Stop Shops for internal use and distribution to external job training service providers. No comprehensive program planning tools are currently in use which effectively tie together all the various aspects of managing a complex program implemented at dozens of sites using multiple funding streams and delivering services to diverse client populations. Job training service programs should be actively managed and not merely administrated.

The functions of program management include: 1) ensuring the active management and coordination of activities takes place at multiple levels and include regular reviews and meaningful accountability; 2) developing a multi-year plan bringing together the necessary information on activities, resources, timescales, monitoring and control functions; 3) the timely tracking of finances and basic costs together with the broader costs of administering the programs; 4) the optimization of performance across the program value chain, both functionally and technically; and 6) the continuous assessment of performance and evolution of new capabilities for the systematic application of learning and knowledge.

The existing GDOL budgeting and data collection processes are important parts of a comprehensive program management system. The USDOL's Federal Research and Evaluation Database (FRED) currently allows access to a limited set of program performance data including WIA demographic, pre-program earnings, unemployment

insurance and TANF status, and type of training service[23]. These data must be expanded to include the program-related information described above, combined with a more comprehensive set of demographic and economic variables, and widely made available to program managers and implementers in a decision-making framework. With respect to the tracking of specific job training services, more detail regarding the type of services received by participants is needed, particularly with respect to Skills Upgrade training. To provide context, more information should be collected from trainees and non-trainees regarding their prior work and educational experiences and analyzed to improve job training program efficacy to workers.

Policy Recommendation 12. National and state-level policymakers should reconsider the tiered system of access to job training services now required by the Workforce Investment Act legislation.

The WIA legislation is based on a "work first" philosophy with the relatively inexpensive "walk in" Core and Intensive Services as gateways to the other job training services including Skills Upgrade training, the track most readily identified with traditional job training. At a minimum, policymakers and legislators should consider revising the WIA program so that workers qualified and desiring to enter Skills Upgrade training could do so in an expeditious manner.

5.2.2. Study Limitations and Directions for Future Research

The limited availability of useful demographic and program data from the Georgia Department of Labor, at both the state and the WIA levels, significantly hindered

[23] Federal Research and Evaluation Database (FRED) Website. U.S. Department of Labor, Employment and Training Administration.

this research. The lack of detailed demographic and workforce data on individual workers impeded research on the efficacy of job training to workers, particularly with respect to the impacts of worker characteristics on post-training wages. As suggested in Policy Recommendation 8, more detailed program and demographic microdata in addition to race and gender should be collected including educational attainment marital and family status, financial status, accurate residential location, and housing characteristics.

More research on worker characteristics is needed to explain why they play such a significant role in the effectiveness of job training services. In particular, why do females benefit more from such services? And what are the salient characteristics that distinguish the training outcomes between the non-LTU and LTU worker populations? The task is made difficult because subtle worker characteristics are difficult to capture in datasets. Acquiring comprehensive data on personal characteristics would require that well-designed surveys be performed at GDOL One-Stop Shops that go well beyond the rudimentary data collected previously. Because administering surveys may involve considerable expense, One-Stop Shops could carefully selected for limited survey data collection or could be randomly chosen as part of a stratified research design.

Within the category of Skills Upgrade training, there are no GDOL data analyses linking the industry from which trainees exit to the type of skills training received. The broad category of Skills Upgrade training includes a wide spectrum of curricula; everything from Air Conditioning Repair to Air Mechanic to Computer Technician, etc. If data can be located that ties the exit industry to the type of Skills Upgrade training, important insights into the efficacy of specific training tracks could be gained.

The availability of county-level ES-202 data from the GDOL makes possible the future study of within-state worker migration patterns. Of interest is how workers adjust to unemployment, both short- and long-term. When faced with long-term or structural unemployment, do workers simply take lower wages in the same area or do they migrate elsewhere in Georgia in search of higher wages, or at least not lower, wages? (The GDOL datasets do not track workers that move out of state.) Once moved, is the wage experience better than comparable workers that did not migrate? Is the time spent looking for work reduced by migration?

The question of whether the Georgia Workforce Development System, and its effectiveness in elevating trainee wages and shortening their time spent in job search, is unique among states is an important one that is not addressed by this research. Similar datasets--the ES-202 firm-level data, the individual worker wage histories, worker microdata for UI benefits and job training data—could be assembled and analyzed for carefully selected states, representative of distinct geographical and economic regions. Finally, data should be gathered for longer time periods than the five years investigated by this research. The time interval should encompass multiple economic cycles; ideally twelve years or more.

REFERENCES

Abraham, K. 1983, "Structural/Frictional versus Demand Deficient Unemployment: Some New Evidence", *American Economic Review*, vol. 73, pp. 708-724.

Abraham, K. & Katz, L. 1986, "Cyclical Unemployment: Sectoral Shifts or Aggregate Disturbances?", *Journal of Political Economy*, vol. 94, no. 1, pp. 507-522.

Abt Associates Inc 2000, *AECF Jobs Initiative: Evaluation Report on the Capacity Development Phase*, Abt Associates, Inc., Cambridge, MA.

Abt Associates Inc and the New School for Social Research 1999, *Private Interests, Shared Concerns: The Relationship Between Employers and the AECF Jobs Initiative*, Abt Associates, Inc. and the New School for Social Research, Cambridge, MA.

Akerloff, G. & Main, B. 1980, "Unemployment Spells and Unemployment Experience", *American Economic Review*, vol. 70, no. 5, pp. 88-93.

Allegretto, S. & Stettner, A. 2004, *Educated, Experienced, and Out of Work*, Economic Policy Institute.

American College of Physicians. *Primer on Cost-Effectiveness Analysis. Effective Clinical Practice,* September-October. 2007. 9-1-2000.

Annie E Casey Foundation 2000, *Stronger Links: New Ways to Connect Low-Skilled Workers to Better Jobs*, Annie E. Casey Foundation, Baltimore.

Ashenfelter, O. 1978, "Estimating the Effect of Training Programs on Earnings", *Review of Economics and Statistics*, vol. 60, pp. 47-57.

Ashenfelter, O. & Card, D. 1985, "Using the Longitudinal Structure of Earnings to Estimate the Effect of Training Programs on Earnings", *Review of Economics and Statistics*, vol. 67, no. 4, pp. 648-666.

Aspen Institute 2001, *Measuring Up and Weighing In: Industry-Based Workforce Development Training Results in Strong Employment Outcomes*, Aspen Institute, Washington, D.C.

_____. 2002, *Grow Faster Together or Grow Slowly Apart: How Will America Work in the 21st Century?*, Aspen Institute, Washington, D.C.

Atkinson, R. D. 1998, *Building Skills for the New Economy*, Progressive Policy Institute, Washington, D.C.

_____.. 2002, *Creating a National Skills Corporation*, Progressive Policy Institute, Washington, D.C.

Barnow, B. 1987, "The Impact of CETA Programs on Earnings: A Review of the Literature", *Journal of Human Resources*, vol. 22, no. Spring.

Bartik, T. & Hollenbeck, K. M. 2000, *The Role of Public Policy in Skills Development of Black Workers in the 21st Century*, W. E. Upjohn Institute for Employment Research, Kalamazoo, MI.

Bartik, T. 2002, "Poverty, Jobs, and Subsidized Employment", *Challenge*, vol. 45, no. 3.

Bassi, L. 1983, "The Effect of CETA on Post Program Earnings of Participants", *Journal of Human Resources*, vol. 38, no. 4, pp. 539-556.

Bell, M., Stevens, D., Barnow, B., & Clinch, R. 1999, *Baltimore Area Jobs and Low-Skill Job Seekers: Assessing the Gaps*, The Abell Foundation, Baltimore.

Berkeley Policy Associates 2002, *Evaluation of the Regional Workforce Preparation and Economic Development Act: Final Report* , Berkeley Policy Associates, Oakland, CA.

_____. 2003, *Creating Partnerships for Workforce Investment: How Services Are Provided Under WIA*, Berkeley Policy Associates, Oakland, CA.

Bernstein, J. 2004, *The Jobless Recovery*, The Economic Policy Institute, Washington, D.C.

Bloom, H. S. 1984, "Estimating the Effects of Job-Training Programs, Using Longitudinal Data: Ashenfelter's Findings Reconsidered", *Journal of Human Resources*, vol. 19, no. 4, pp. 543-556.

Bloom, H. S. 1987, "What Works for Whom? CETA Impacts for Adult Participants", *Evaluation Review*, vol. 11, no. 4, pp. 510-527.

Bluestone, B. & Harrison, B. 1984, *The Deindustrialization of America* Basic Books, New York.

Bolton, R. 1992, "Place Prosperity vs. People Prosperity Revisited: An Old Issue with a New Angle", *Urban Studies*, vol. 29, no. 2.

Borus, M. E. 1978, "Indicators of CETA Performance", *Industrial and Labor Relations Review*, vol. 32, no. 3, pp. 3-14.

Bowers, N. 1980, "Probing the Issues of Unemployment Duration", *Monthly Labor Review* no. July, pp. 23-32.

Brown, C. 1983, "Unemployment Theory and Policy, 1946-1980", *Industrial Relations* pp. 164-185.

Bryant, E. C. & Rupp, K. 1987, "Evaluating the Impact of CETA on Participant Earnings", *Evaluation Review*, vol. 11, no. 4, pp. 473-492.

Buck, M. L. 2002, *Charting New Territory: Early Implementation of the Workforce Investment Act*, Public/Private Ventures, New York.

Burghhardt, J. 2001, *Does Job Corps Work? Summary of the National Job Corps Study*, Mathematica Policy Research, Princeton, NJ.

Cain, G. G. 1976, "The Challenge of Segmented Labor Market Theories to Orthodox Theory: A Survey", *Journal of Economic Literature*, vol. 14, pp. 215-257.

Carnevale, A. & Reich, K. 2004, *A Piece of the Puzzle: How States Can Use Education to Make Work Pay for Welfare Recipients*, Educational Testing Service, Princeton, NJ.

Center for Workforce Preparation 2001, *Keeping Competitive: A Report from a Survey of 1,800 Employers*, Center for Workforce Preparation, Washington, D.C.

_____. 2002, *Completing the Workforce Puzzle*, U.S. Chamber of Commerce, Center for Workforce Preparation, Washington, D.C.

Clark, K. & Summers, L. 1979, *Labor Market Dynamics and Unemployment: A Reconsideration*, The Brookings Institution, Washington, D.C., 1.

Clymer, C., Roberts, B., & Strawn, J. 2002, *States of Change: Policies and Programs to Promote Low-Wage Workers' Steady Employment and Advancement*, Public/Private Ventures, Philadelphia.

Couch, K. A. 1992, "New Evidence on the Long-Term Effects of Employment Training Programs", *Journal of Labor Economics*, vol. 10, no. 4, pp. 380-388.

Craig, H., Miller, J., & Molina, F. 2002, *Work Support Centers: New Vehicles to Reach Low-Wage Workers*, Manpower Demonstration Research Corporation, New York.

Dickinson, K. P., Johnson, T. R., & West, R. W. 1986, "An Analysis of the Impact of CETA Programs on Participant's Earnings", *Journal of Human Resources*, vol. 21, no. 1, pp. 64-91.

_____. 1987, "The Impact of CETA Programs on Components of Participants Earnings", *Industrial and Labor Relations Review*, vol. 40, no. 3, pp. 430-441.

Dunne, T., Roberts, M. J., & Samuelson, L. 1989, "Plant Turnover and Gross Employment Flows in the US Manufacturing Sector", *Journal of Labor Economics*, vol. 7, no. 1, pp. 48-71.

Economic Policy Institute 2004, *EPI Issue Guide: Offshoring*, Economic Policy Institute, Washington, D.C.

Eisen, P. 2004, *Today's Manufacturing Layoffs Mask a Looming Shortage of Skilled Workers in the U.S.*, National Association of Manufacturers, Washington, D.C.

Elliot, M., Roder, A., King, E., & Stillman, J. 2001, *Gearing Up: An Interim Report on the Sectoral Initiative*, Public/Private Ventures, New York.

Employment and Training Administration 2004, *Fiscal Year 2004 Budget Request Overview*, U.S. Department of Labor, Washington, D.C.

Fischer, D. J., Kleiman, N. S., & Alssid, J. I. 2002, *Rebuilding Job Training from the Ground Up: Workforce System Reform after 9/11*, Center for an Urban Future and Workforce Strategy Center, New York.

Fitzgerald, J. 2000, *Community Colleges as Labor Market Intermediaries: Building Career Ladders for Low Wage Workers*, Center for Urban and Regional Policy, Northeastern University, Boston.

Fleischer, W. 2004, *Extending Ladders: Findings from the Annie E. Casey Foundation's Job Initiative*, Annie E. Casey, Baltimore.

Flinn, C. & Heckman, J. 1983, "Are Unemployment and Out of the Labor Force Behaviorally Different Labor Force States?", *Journal of Labor Economics*, vol. 1, no. 1, pp. 28-42.

Freedman, S., Knab, J. T., Gennetian, L. A., & Navarro, D. 2000, *The Los Angeles Jobs-First GAIN Evaluation: Final Report on a Work First Program in a Major Urban Center*, Manpower Demonstration Research Corporation, New York.

Gay, R. S. & Borus, M. E. 1980, "Validating Performance Indicators for Employment and Training Programs", *Journal of Human Resources*, vol. 15, no. 1, pp. 29-48.

Georgia Department of Labor 2003, *Quickstats Industry Estimates, 2003*, Georgia Department of Labor, GDOL website, accessed May 2007.

_____. 2004, *State Unified Plan Submitted Under Section 501 of the Workforce Investment Act of 1998 State of Georgia for the Period of July 1, 2000 - June 30, 2005*, Georgia Department of Labor, Atlanta, GA.

Gibbons, R. & Katz, L. F. 1991, "Layoffs and Lemons", *Journal of Labor Economics*, vol. 9, no. 4, pp. 351-380.

Giloth, R. P. 2000, "Learning from the Field: Economic Growth and Workforce Development in the 1990s", *Economic Development Quarterly*, vol. 14, no. 4, pp. 340-359.

_____. 2004, *Workforce Development Politics* Temple University Press, Philadelphia.

_____. 2004, *Workforce Intermediaries of the Twenty-first Century* Temple University Press, Philadelphia.

Ginzberg, E. 1996, "MDTA and CETA," in *Of Heart and Mind: Social Policy Essays in Honor of Sar A. Levitan*, G. Mangum & S. Mangum, eds., Kalamazoo, MI.

Goldhaber, D. & Brewer, D. 1996, "Why Don't Schools and Teachers Seem to Matter?", *Journal of Human Resources*, vol. 32, no. 3.

Gottschalk, P. & Maloney, T. 1985, "Involuntary Terminations, Unemployment, and Job Matching: A Test of Job Search Theory", *Journal of Labor Economics*, vol. 3, no. 2, pp. 109-123.

Groshen, E. & Potter, S. 2003, "Has Structural Change Contributed to a Jobless Recovery?", *Current Issues in Economics and Finance*, vol. 9, no. 8, pp. 1-7.

Grubb, W. N. 1995, *Evaluating Job Training Programs in the United States: Evidence and Explanations*, National Center for Research in Vocational Education, Berkeley, CA, MDS-1047.

Hall, R. 1972, *Turnover in the Labor Force*, Brookings Papers on Economic Activity, 3.

_____. 1982, "The Importance of Lifetime Jobs in the US Economy", *American Economic Review*, vol. 72, no. 4, pp. 716-724.

Harrison, B. & Weiss, M. 1998, *Workforce Development Networks: Community-Based Organizations and Regional Alliances* Sage Publications, Thousand Oaks, CA.

Heckman, J. & Hotz. J. 1988, *Choosing Among Alternative Nonexperimental Methods for Estimating the Impact of Social Programs: The Case for Manpower Training*, National Bureau of Economic Research, Washington, D.C., Working Paper No. 2861.

Heckman, J. J., Ishimura, H., & Todd, P. E. 1997, "Matching as an Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Program", *Review of Economic Studies*, vol. 64, no. 4, pp. 605-664.

Henderson, N. A Difficult Lesson: Job Retraining, Though Touted, Often Fails the Test. washingtonpost.com [April 16], E01. 2004. The Washington Post.

Hill, H., Kirby, G., & Fraker, T. 2004, *Delivering Employment Retention and Advancement Services: A Process Study of Iowa's Post-employment Pilot*, Mathematica Policy Research, Washington, D.C.

Hollenbeck, K. M., Kimmel, J., & Eberts, R. W. 1997, *Using Administrative Data to Evaluate the Ohio JOBS Student Retention Program*, W. E. Upjohn Institute for Employment Research, Kalamazoo, MI.

Hollenbeck, K. M. 2002, *Washington's Workforce Development System Pays Off*, W. E. Upjohn Institute for Employment Research, Kalamazoo, MI.

_____. 2003, *Net Impact Estimates of the Workforce Development System in Washington State*, W. E. Upjohn Institute for Employment Research, Kalamazoo, MI.

_____. 2004, *Using Administrative Data for Workforce Development Program Evaluation*, W. E. Upjohn Institute for Employment Research, Kalamazoo, MI, Working Paper No. 04-103.

Holzer, H. 1986, "Reservation Wages and Their Labor Market Effects for Black and White Male Youth", *Journal of Human Resources*, vol. 21, pp. 157-177.

Holzer, H., Lane, J., & Anderson, F. 2002, *The Interactions of Workers and Firms in the Low-Wage Labor Market*, U.S. Census Bureau, Washington, D.C.

Holzer, H. & Waller, M. 2003, *The Workforce Investment Act: Reauthorization to Address the "Skills" Gap*, Brookings Institution, Washington, D.C.

Hoque, A. & Inder, B. A. 1991, "Structural Unemployment in Australia", *Applied Economics*, vol. 23, no. 4B, pp. 723-730.

Hotchkiss, J. L., Pitts, M. M., & Robertson, J. C. 2003, *The Ups and Downs of Jobs in Georgia: What We Can Learn about Employment Dynamics from State Administrative Data?*, Federal Reserve Bank of Atlanta, 2003-38.

Houseman, S. N., Kalleberg, A. L., & Erickcek, G. 2003, "The Role of Temporary Agency Employment in Tight Labor Markets", *Industrial and Labor Relations Review*, vol. October.

Huntington, S. P. 1981, *American Politics: The Promise of Disharmony* Belknap Press of Harvard University, Cambridge, MA.

Hyclack, T. 1996, "Structural Changes in Labor Demand and Unemployment in Local Labor Markets", *Journal of Regional Science*, vol. 36, no. 4, pp. 653-663.

Ilg, R. E. 1994, "Long-term Unemployment in Recent Recessions", *Monthly Labor Review*, vol. 117, no. 6, pp. 12-15.

Iversen, R. 2002, *Moving Up Is a Steep Climb*, Annie E. Casey, Baltimore.

Jacobson, L., LaLonde, R., & Sullivan, D. 1993, "Earnings Losses of Displaced Workers", *American Economic Review*, vol. 83, no. 4, pp. 685-709.

Job Training Partnership Act: Long-term Earnings and Employment Outcomes 1996, U.S. General Accounting Office, GAO/HEHS-96-40.

Katz, L. F. & Meyer, B. D. 1990, "The Impact of the Potential Duration of Unemployment Benefits on the Duration of Unemployment", *Journal of Public*

Economics, vol. 41, pp. 45-72.

Kaufman, B. 1994, *The Economics of Labor Markets*, 4th edn, Dryden Press, New York.

Killingsworth, C. 1966, *Structural Unemployment in the United States*, St. Martin's Press, New York.

_____. 1978, "The Rise and Fall of the Idea of Structural Unemployment", Industrial Relations Research Association, Madison, Wisconsin, pp. 1-13.

Kletzer, L. G. 2003, *Trade-Related Job Loss and Wage Insurance: A Synthetic Review* Paper 02-28.

Kletzer, L. G. & Litan, R. E. 2004, "A Prescription to Relieve Worker Anxiety", *Brookings Policy Brief*, vol. 73, pp. 1-9.

Lafer, G. 1994, "The Politics of Job Training: Urban Poverty and the False Promise of JTPA", *Politics and Society*, vol. 22, no. 3, pp. 349-388.

_____. 2004, *Job Training Charade* Cornell University Press, Ithaca, NY.

LaLonde, R. 1986, "Evaluating the Econometric Evaluations of Training Programs with Experimental Data", *American Economic Review*, vol. 76, no. 4, pp. 604-620.

_____. 1995, "The Promise of Public Sector-Sponsored Training Programs", *Journal of Economic Perspectives*, vol. 9, no. 2, pp. 149-168.

LeFranc, A. Labor Market Dynamics and Wages Losses of Displaced Workers in France and the United States. [614]. 2003. William Davidson Institute. Working Paper.

Levin, H. M. & McEwan, P. J. 2000, *Cost-effectiveness Analysis: Methods and Applications*, 2nd edn., Sage Publications.

Levy, J. 1995, "Benefit-Cost Analysis," in *Essential Microeconomics for Public Policy*, Praeger, Westport, Connecticut, pp. 135-147.

Lillien, D. 1980, "The Cyclical Pattern of Temporary Layoffs in US Manufacturing", *Review of Economics and Statistics*, vol. 62, no. 1, pp. 24-31.

_____. 1982, "Sectoral Shifts and Cyclical Unemployment", *Journal of Political Economy*, vol. 90, no. 4, pp. 777-793.

Lynch, G. J. & Hyclack, T. 1984, "Cyclical and Noncyclical Unemployment Differences among Demographic Groups", *Growth and Change*, vol. 15, no. 1, pp. 9-17.

Martinson, K. & Strawn, J. 2002, *Built to Last: Why Skills Matter for Long-Run Success in Welfare Reform*, Center for Law and Social Policy, Washington, D.C.

Matilla, P. 1974, "Job Quitting and Frictional Unemployment", *American Economic Review*, vol. 64, no. 1, pp. 235-239.

McCall, J. 1970, "Economics of Information and Job Search", *Quarterly Journal of Economics*, vol. 84, no. 1, pp. 113-126.

McLaughlin, K. J. 1991, "A Theory of Quits and Layoffs with Efficient Turnover", *Journal of Political Economy*, vol. 99, no. 1, pp. 1-29.

Melendez, E. 1996, *Working On Jobs: The Center for Employment Training*, The Gaston Institute, University of Massachusetts at Boston, Boston.

Miller, C., Bos, J. M., Porter, K. E., Tseng, F. M., Doolittle, F. C., Tanguay, D. N., & Vencil, M. P. 2003, *Working with Disadvantaged Youth: Thirty-Month Findings from the Evaluation of the Center for Employment Training Replication Sites*, Manpower Demonstration Research Corporation, New York.

Mocan, H. N. 1999, "Structural Unemployment, Cyclical Unemployment, and Income Inequality", *Review of Economics and Statistics*, vol. 81, no. 1, pp. 122-134.

Moore, R. W., Blake, D. R., & Phillips, G. M. 1995, *Accounting for Training: An Analysis of the Outcomes of California Employment Training Panel Programs*, California State University, Northridge School of Business Administration and Economics, Northridge, CA.

Mortenson, D. T. 1970, “Job Search, the Duration of Unemployment, and the Phillips Curve”, *American Economic Review*, vol. 60, no. 5, pp. 847-862.

Moser, J. 1986, “Labor Market Transitions”, *Industrial and Labor Relations Review*, vol. 39, no. 1, pp. 251-263.

Muhlhausen, D. & Kersey, P. 2004, *In the Dark about Job Training: Federal Job Training Programs Have a Record of Failure*, The Heritage Foundation, Washington, D.C.

O'Shea, D. & King, C. 2001, *The Workforce Investment Act of 1998: Restructuring Workforce Development Initiatives in States and Localities*, The Nelson A. Rockefeller Institute of Government, Albany, NY, 12.

O'Sullivan, A. 1993, *Urban Economics*, 2nd edn, McGraw-Hill/Irwin; New York.

Orr, L. L., Bloom, H. S., Bell, S. H., Doolittle, F., & Lin, W. 1996, *Does Training for the Disadvantaged Work? Evidence from the National JTPA Study* Urban Institute Press, Washington, D.C.

Osberg, L. & Lin, Z. 2004, “How Much of Canada's Unemployment Is Structural?”, *Canadian Public Policy--Analyse de Politiques* , vol. 26, no. Special Supplement 1, p. S141-S157.

Perry, G. 1972, *Unemployment Flows in the US Labor Market*, Brookings Institution, Washington, D.C.

Plastric, P., Seltzer, M., & Taylor, J. C. 2001, *A Framework for Labor Market Systems Reform for Jobs Initiative Sites*, Jobs for the Future, Boston.

Podursky, M. 1984, “Sources of Secular Increases in the Unemployment Rate, 1969-82”, *Monthly Labor Review* no. July, pp. 19-25.

Public/Private Ventures 1999, *State Workforce Policy Initiative*, Publci/Private Ventures, New York.

Rademacher, I., Bear, M., & Conway, M. 2001, *Project Quest: A Case Study of a Sectoral Employment Development Approach*, The Aspen Institute, Washington, D.C.

_____. 2002, *Working With Value: Industry-Specific Approaches to Workforce Development*, The Aspen Institute, Washington, D.C.

Raphael, S., Stoll, M., & Melendez, E. "Does Job Training Pay?".

Regional Technology Strategies Inc. 1999, *A Comprehensive Look at State-Funded, Employer-Focused Job Training Programs*, National Governor's Association, Washington, D.C.

Regional Technology Strategies 1999, *A Comprehensive Look At State-Funded, Employer-Focused Job Training Programs*, National Governor's Association, Washington, D.C.

Regional Workforce Partnership 2002, *Workforce and Economic Development: An Agenda for Pennsylvania's Next Governor*, Regional Workforce Partnership, Philadelphia.

_____. 2002, *Workforce 2002: Measuring What Matters*, Regional Workforce Partnership, Philadelphia.

Riddell, W. 2000, "Measuring Unemployment and Structural Unemployment", *Canadian Public Policy--Analyse de Politiques*, vol. 26, no. Special Supplement No. 1, p. S101-S108.

Ruhm, C. 1991, "Are Workers Permanently Scarred by Job Displacements?", *American Economic Review*, vol. 81, no. 1, pp. 319-324.

Ryscavage, P. & Short, K. 2004, *Counting Spells of Unemployment*, U.S. Bureau of the Census, Washington, D.C.,. 109.

Shapiro, C. & Stiglitz, J. 1984, "Equilibrium Unemployment as a Worker Discipline Device", *American Economic Review*, vol. 74, pp. 433-444.

Shiskin, J. 1976, "Employment and Unemployment: The Doughnut or the Hole", *Monthly Labor Review*, vol. 99, no. 2, pp. 3-10.

Simler, N. J. 1964, "Long-term Unemployment, the Structural Hypothesis, and Public Policy", *American Economic Review*, vol. 54, pp. 985-1001.

Smith, W., Wittner, J., Spence, R., & Van Kleunen, A. 2002, *Skills Training Works: Examining the Evidence*, The Workforce Alliance, Washington, D.C.

Spence, R. & Kiel, B. 2003, *Skilling the American Workforce "On the Cheap": Ongoing Shortfalls in Federal Funding for Workforce Development*, The Workforce Alliance, Washington, D.C.

Spletzer, J. R. 2000, "The Contribution of Establishment Births and Deaths to Employment Growth", *Journal of Business & Economic Statistics*, vol. 18, no. 1, pp. 113-126.

_____. 2001, "Measuring Job and Establishment Flows with BLS Longitudinal Microdata", *Monthly Labor Review*, vol. 124, no. 4, pp. 13-20.

Stettner, A. & Wenger, J. 2003, *The Broad Reach of Long-term Unemployment*, Economic Policy Institute.

Stevens, D. W. 2003, *Administrative Data Research and Evaluation (ADARE) Project*, Employment and Training Administration, U.S. Department of Labor, Washington, D.C.

Stigler, G. 1962, "Information in the Labor Market", *Journal of Political Economy*, vol. 70, no. 2, pp. 94-105.

Stiokov, V. 1966, "Some Determinants of the Level of Frictional Unemployment: A Comparative Study", *International Labor Review*, vol. 93, pp. 530-549.

Strawn, J. 1998, *Beyond Job Search or Basic Education: Rethinking the Role of Skills in Welfare Reform*, Center for Law and Social Policy, Washington, D.C.

_____. 1999, *Welfare-to-Work Programs: The Critical Role of Skills*, Center for Law and Social Policy, Washington, D.C.

Strawn, J. & Martinson, K. 2000, *Steady Work and Better Jobs: How To Help Low-Income Parents Sustain Employment and Advance in the Workforce*, Manpower Demonstration Research Corporation, New York.

Summers, L. 1986, *Why Is the Unemployment Rate So Very High Near Full Employment?*, The Brookings Institution, Washington, D.C., 2.

_____. 1990, *Understanding Unemployment.* The MIT Press, Cambridge, MA.

The Workforce Alliance 2001, *A Report from the Field: Workforce Stakeholders on the Local Impact of Federal Policies*, The Workforce Alliance, Washington, D.C.

_____. 2003, *Workforce Development Policies: Background and Current Issues*, The Workforce Alliance, Washington, D.C.

U.S. Department of Labor 2000, *Workforce Investment Act Final Rules* Washington, D.C., 20 CFR Part 652.

US Department of Labor Office of the Chief Economist 1995, *What's Working (and What's Not): A Summary of the Research on the Economic Impacts of Employment and Training Programs*, U.S. Government Printing Office, Washington, D.C.

US General Accounting Office 1995, *Multiple Employment Training Programs: Major Overhaul Needed to Create a More Efficient, Customer-Driven System*, U.S. General Accounting Office, Washington, D.C.

Veneri, C. M. 1999, "Can Occupational Shortages Be Identified Using Available Data?", *Monthly Labor Review*, vol. 122, no. 3, pp. 15-21.

W.K. Kellog Foundation 2004, *Workforce Development: Employment Retention and Advancement Under TANF*, W.K. Kellog Foundation, Washington, D.C.

Wachtel, H. 1979, "The Impact of Labor Market Conditions on Hard Core Unemployment: A Case Study of Detroit", *Poverty and Human Resources* pp. 5-11.

Walsh, S. 2000, *Evaluation of the Center for Employment Training Replication Sites*, Berkeley Policy Associates, Manpower Demonstration Research Corporation, Oakland, CA.

Weiler, S. 2001, "Unemployment in Regional Labor Markets: Using Structural Theories to Understand Local Jobless Rates in West Virginia", *Industrial and Labor Relations Review*, vol. 54, no. 3, pp. 573-592.

Weir, M. 1992, *Politics and Jobs* Princeton University Press, Princeton, NJ.

White, K. R. 1988, "Cost Analysis in Family Support Systems," in *Evaluating Family Programs*, H. B. Weiss & F. H. Jacobs, eds., Aldyne de Gruyter, New York, pp. 429-443.

White, S., Zipp, J. F., McMahon, W. F., Reynolds, P. D., Osterman, J. D., & Binkley, L. S. 1984, "ES-202: The Database for Local Employment Analysis", *Economic Development Quarterly*, vol. 4, no. 3, pp. 240-253.

Winders, R. 2000, "Small Business Development and Non-metropolitan Job Growth in Georgia", *Growth and Change*, vol. 31, no. 1, pp. 82-107.

Wooldridge, J. M. 1999, *Introductory Econometrics: A Modern Approach* South-Western College Publishing.

Workforce Information Council 2003, *New Tools for a New Era!*, Bureau of Labor Statistics and the Workforce Information Council, Washington, D.C., Proceedings July 23-24, 2003.

Zandniapour, L. & Conway, M. 2002, *Gaining Ground: The Labor Market Progress of Participants of Sectoral Employment Development Programs*, The Aspen Institute, Washington, D.C.